



12 - 19 JULY 2016

# XXIII ISPRS CONGRESS



FROM HUMAN HISTORY TO THE FUTURE WITH SPATIAL INFORMATION

PRAGUE 2016

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# 1 ACKNOWLEDGEMENT



# Acknowledgement

The XXIII ISPRS Congress is being held under the auspices of **the Minister of Agriculture**  
and **the Minister of Transport**



MINISTERSTVO ZEMĚDĚLSTVÍ



Ministerstvo dopravy

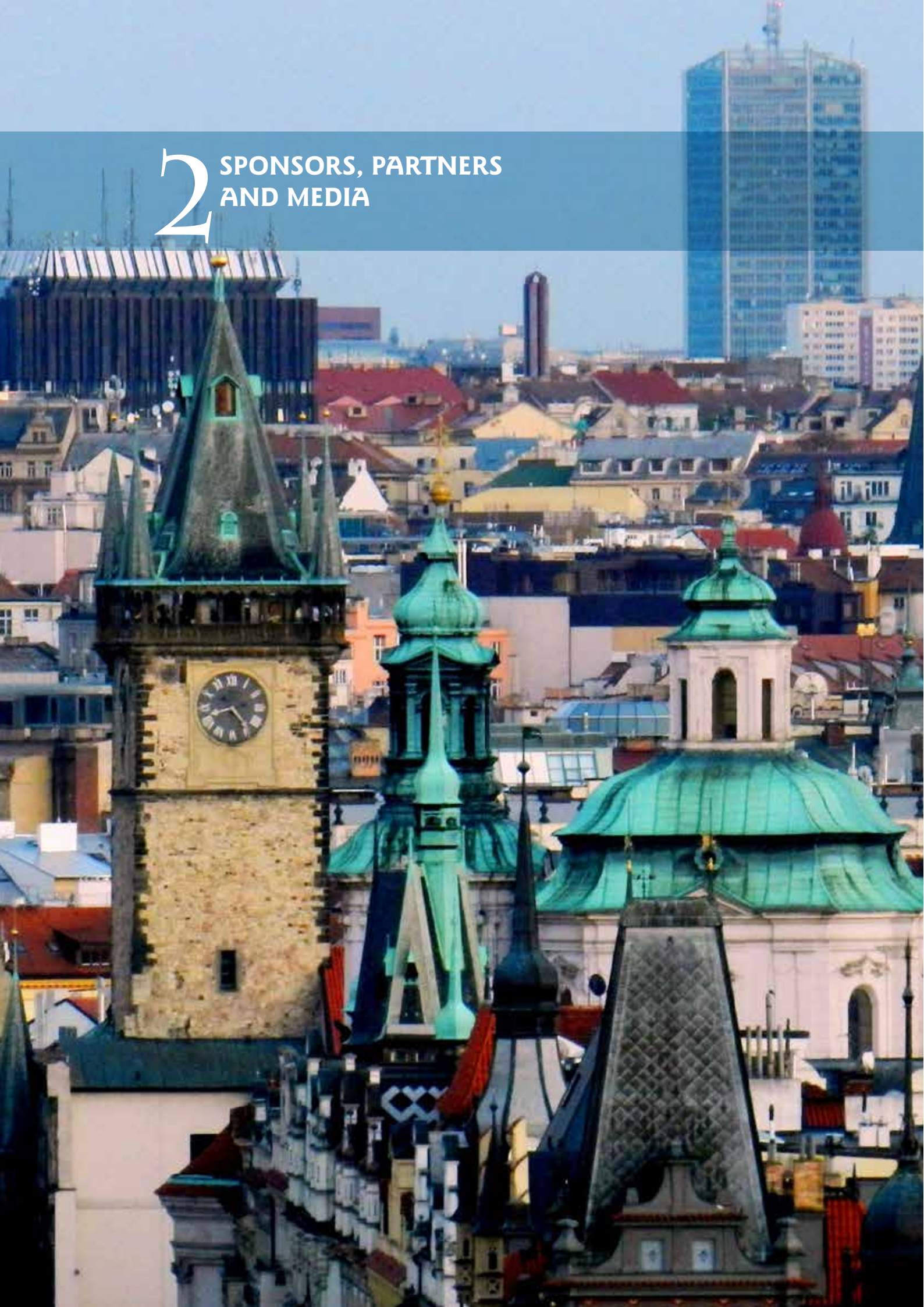
## General Assembly Sponsors

The ISPRS Prague 2016 Local Organizers extend their appreciation to the **City of Prague** for its  
invaluable commitment and support of the 2016 ISPRS General Assembly

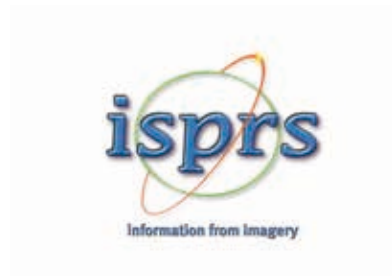




# 2 SPONSORS, PARTNERS AND MEDIA







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# 3 WELCOME LETTERS





## Welcome

Welcome to the XXIII ISPRS Congress in Prague, Czech Republic, from 12-19 July 2016. This eight day Congress offers us a unique occasion to evaluate the significant progress achieved in our disciplines since the end of the last Congress in Melbourne, and to discuss future research and development directions.

After four years of hard work, Lena Halounova and her team have prepared an exciting programme reflecting both the scientific work of ISPRS and other activities in the field of geospatial information relevant to ISPRS. Under the theme 'From human history to the future with spatial information', the programme consists of meetings of the ISPRS General Assembly, plenary speakers, technical sessions, industry exhibition and social events. For the first time you will find a joint forum for National Mapping Agencies and Space Agencies. There is also a strong programme for early career researchers and for commercial companies. With this colourful programme, you will be able to catch up with developments in photogrammetry, remote sensing and spatial information science, and to identify new ways for supporting global sustainability and Future Earth with geo-information.

Prague is located in the heart of Europe and is a well-known venue for international conferences. Professor Eduard Doležal, the founder of ISPRS, was also born in the southern part of the Czech Republic. This Congress will also provide you with the opportunity to discover the many architectural and cultural treasures of Prague, and to experience the marvelous landscape of the Czech Republic.

On behalf of ISPRS Council, I would like to thank Lena Halounova and her team, as well as all the supporters, for the preparation of this vibrant Congress programme. I encourage all of you to fully participate in this quadrennial ISPRS Congress, and to share your experiences with others. By doing so, I am sure you will find the XXIII ISPRS Congress to be a very successful and rewarding one.

**Jun Chen**  
ISPRS President



## A Few Words from the Congress Director



It is my pleasure to write these words one month before the first day of the Prague XXIII ISPRS Congress. Authors from all over the world submitted nearly two thousand contributions. Submissions for the reviewing were twofold – abstracts and full papers.

Abstracts were peer-reviewed and after acceptance, authors were asked to submit a Final Paper to be published in the ISPRS Archives. Full papers were double-blind reviewed and the authors of accepted papers submitted their Final Papers to be published in the ISPRS Annals.

771 experts worked as reviewers and processed 3550 reviews in the period between 13 December and 1 February 2016.

Their reviews were constructive and encouraging. A considerable number of reviewers elaborated substantially more than 10 reviews. I would like to express my admiration to the work they did in their leisure time during quite a difficult period – end of 2015 and beginning of 2016 without any reward. Since the review process was blind, authors cannot thank their reviewers for recommendations, new ideas and useful advice.

It is not possible to count the hours that all researches, authors, Working Group Chairs, Technical Commission Presidents and members of the Local and International Program Committees spent in the preparation of the Congress, but I am sure that all their effort and energy is equivalent to those spent in the construction of the Charles Bridge in Prague. We do not know the names of people who worked on its construction, however, we still use the bridge today. Nevertheless, we do know the names of all authors of submissions, which were accepted to the Congress. We will be able to find them from 1 July 2016 in the XXIII ISPRS Congress publications at the ISPRS webpage.

I believe your “stones” to the development of photogrammetry, remote sensing and spatial sciences will forward our knowledge to allow us or everyone who might need it to continue in our work –work which helps people and benefits the Earth if it is used in the right way. It is not a trifle.

So, please, do not give up when you do not trust yourselves. Try to find a solution. We will appreciate it – maybe already during this Congress, maybe in the future.

  
**Lena Halounová**

## Dear ISPRS Congress Delegates,

I would like to express my support on behalf of Czech Office for Surveying, Mapping and Cadastre to the XXIII International Society for Photogrammetry and Remote Sensing Congress in Prague.

Photogrammetry and remote sensing play an important role in nature science in many spheres of the present life. They help us to understand and better analyze and control many various phenomena of the Earth and its actual state of the environment.

Aerial photographs were systematically collected in Czechoslovakia already before the Second World War, a predecessor of the Czech Republic. The Czech Society for Photogrammetry was founded in 1930 and has been taking part in many international activities since the ISP III in Zurich in 1930 and therefore has a long history of photogrammetry applications and international contacts. Czech Institute for Survey, Mapping and Cadastre has been using aerial photogrammetry for mapping since 1950s.

I am very pleased that ISPRS enhances its interest to close cooperate with National Mapping and Cadastre Agencies by organizing the National Mapping and Cadastre Agencies Forum.

The Czech Republic has been supporting organization of many scientific congresses and conferences to show scientific interest of our specialist to belong to the world highest level of knowledge and present their advances.

Dear Delegates, it is my honor to present my personal support to the XXIII. International Society for Photogrammetry and Remote Sensing Congress in Prague.

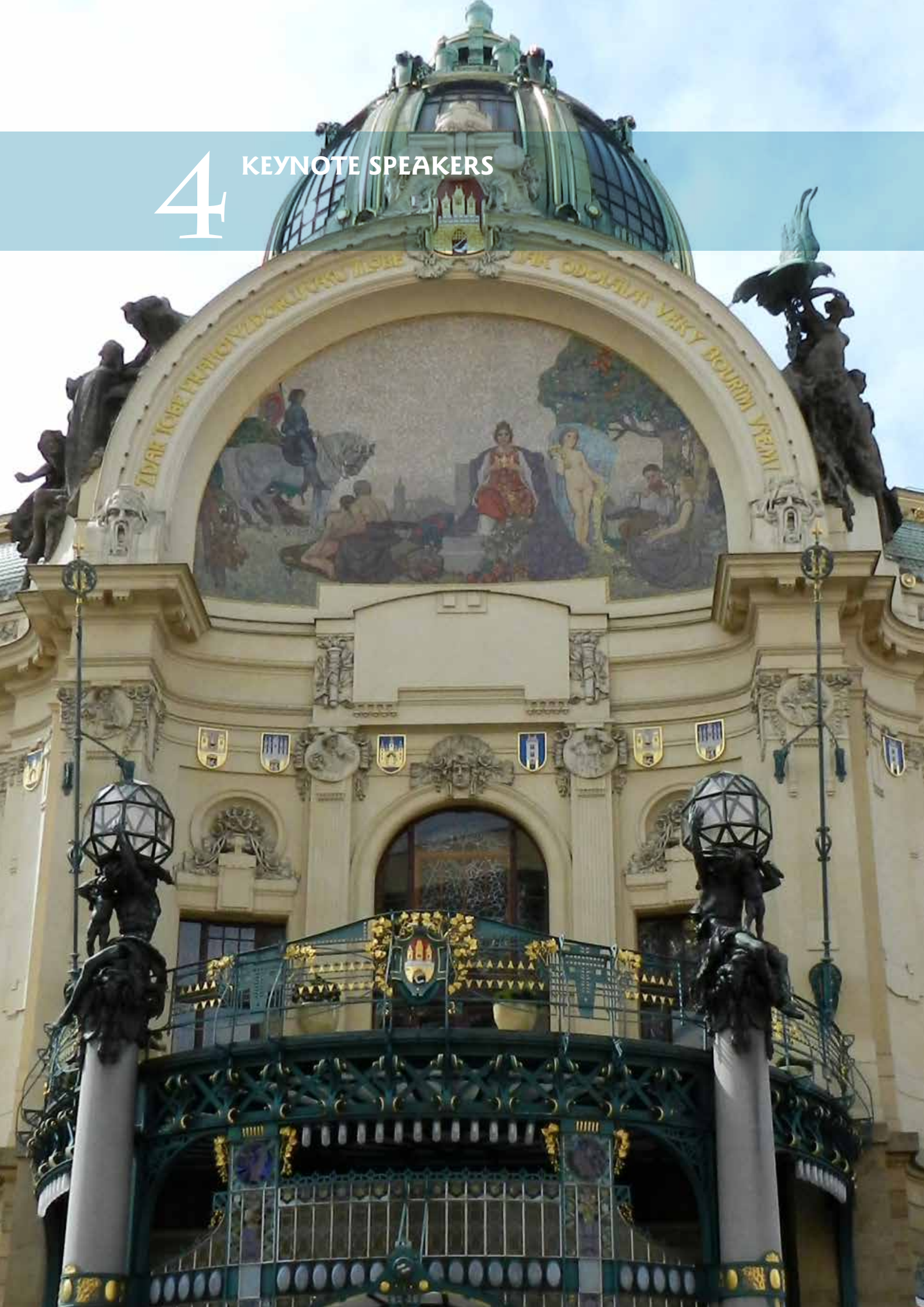
Yours truly

**Ing. Karel Večeře**

Chairman of the Czech Office for Surveying,  
Mapping and Cadastre

4

KEYNOTE SPEAKERS





## Open Ceremony Speakers

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**JÜRGEN DOLD**

Leica Hexagon, Switzerland

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**NADIA MAGNENAT THALMANN**

MIRALab, Switzerland

---

**PAUL ARTHUR BERKMAN**

Tufts University, Massachusetts, USA

---

**DEREN LI**

Wuhan University, China

---

**SHAILESH NAYAK**

Earth System Science Organisation, India

---

**ALBERTO MOREIRA**

Institute at the German Aerospace Center (DLR), Germany

---

**MLADEN STOJIC**

Hexagon, Switzerland

---

**TOMÁŠ PAJDLA**

Czech Technical University in Prague, Czech Republic

---

**CYRILL STACHNISS**

University of Bonn, Germany

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**Ming-Hsiang Tsou**

San Diego State University, California, USA

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**HEIDE HACKMANN**

The International Council for Science (ICSU), France



# 5 PROGRAM XXIII ISPRS WEDNESDAY 13 JULY





## Wednesday, 13 July, 2016

TIME	LOCATION	SESSION
08:30 - 10:00	Congress Hall	Plenary 1
10:30 - 11:30	North Hall	Commercial session I
	Club H	I/2 - LiDAR, SAR and Optical Sensors for Airborne and Spaceborne Platforms 1
	Club A	II/1 - Spatio-temporal Modelling 1
	Club B	III/1 - Orientation and Surface Reconstruction 1
	Club C	IV/2 - Global Status of Mapping and Geospatial Database Updating
	Club D	IV/SpS 12 - EuroSDR: Innovative technologies and methodologies for NMCAs“ 1
	Meeting Hall I A	V/2 - Cultural Heritage Data Acquisition and Processing: 3D modeling strategies
	Meeting Hall I B	VII/5 - Methods for Change Detection and Process Modelling 1
	Club E	VIII/ThS 2 - Operational Remote Sensing Application Services 1
13:30 - 14:30	North Hall	Commercial session II
13:30 - 15:00	Club B	I/SpS 9 - GALILEO and COPERNICUS: geospatial and land applications and services
	Small Hall III	I/Vb - Unmanned Vehicle System (UVS): Sensors and Applications 1
	Club A	II/1 - Spatio-temporal Modelling 2
	Club H	IV/1 - Methods for the Update and Verification of Geospatial Databases 1
	Club E	V/5 - Close-range Measurements for Biomedical Sciences and Geosciences 1
	Club C	VI/1 - Web-based Resource Sharing for Education and Collaborative Research
	Meeting Hall I A	VII/4 - Methods for Image Classification 1
	Club D	VIII/ThS 2 - Operational Remote Sensing Application Services 2
15:00 - 16:00	North Hall	Commercial session III
15:00 - 16:30	Foyer 3rd Floor	Interactive session (I/2, I/Vb, II/1, III/1, III/3, IV/2, V/3, VII/5, ThS16)
16:30 - 17:30	North Hall	Commercial session IV: Blue Marble Geographics

16:30 - 18:00	Small Hall I	I/Vb - Unmanned Vehicle Systems (UVS): Sensors and Applications 2
	Club B	II/ThS 16 - Perceptual and cognitive experiments with imagery and 3D models
	Club A	III/3 - Image Sequence Analysis 1
	Club C	IV/SpS 12 - EuroSDR: Innovative technologies and methodologies for NMCAs“ 2
	Club H	V/3 - Terrestrial 3D Imaging and Sensors 1
	Meeting Hall I A	VII/4 - Methods for Image Classification 2
	Meeting Hall I B	VIII/1 - Disaster and Risk Reduction 1
	Club D	VIII/Ths 2 - Operational Remote Sensing Application Services 3

## Wednesday 13 July 2016

### **13/7 08:30 - 10:00 Plenary 1**

Session Chair: Jun Chen, ISPRS/National Geomatics Center of China

Session Co-Chair: Orhan Altan, ISPRS 1st Vice President

#### **08:30 Towards a Transformative Science for a Sustainable and Just World**

Heide Hackmann, ICSU, France

#### **09:00 Knowledge Discovery for Global Sustainability**

Paul Arthur Berkman, Fletcher School of Law and Diplomacy, Tufts University, MA, USA

#### **09:30 Earth Observations to Services: A Perspective**

Shailesh Nayak, Earth System Science Organisation, India

### **13/7 10:30 - 11:30 Commercial session I**

#### **10:30 Bentley Systems**

Jan Blaauboer

### **13/7 10:30 - 12:00 I/2 - LiDAR, SAR and Optical Sensors for Airborne and Spaceborne Platforms 1**

Session Chair: Boris Jutzi, KIT

Session Co-Chair: Dorota Iwaszczuk, Technische Universität München

#### **10:30 Analysis of the effect of wave patterns on refraction in airborne LiDAR bathymetry**

Patrick Westfeld, TU Dresden, Institute of Photogrammetry and Remote Sensing, Germany

#### **10:48 On-line wavelength calibration of pulsed laser for CO<sub>2</sub> differential absorption lidar**

Chengzhi Xiang, State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, China

#### **11:06 A universal de-noising algorithm for ground-based lidar signal**

Xin Ma, Wuhan University, China

#### **11:24 Cmos imaging sensor technology for aerial mapping cameras**

Klaus Neumann, Leica Geosystems, Germany

#### **11:42 Single Photon LiDAR. An Efficient Technique for High Speed Topographic and Bathymetric Mapping**

Marcos Sirota, Sigma Space / Hexagon, USA

### **13/7 10:30 - 12:00 II/1 - Spatio-temporal Modelling 1**

Session Chair: Xiaohua Tong, Tongji University

Session Co-Chair: Jiangping Chen, Wuhan University

#### **10:30 Historical GIS Data and Change in Morphological Parameters for the Analysis of Urban Heat Island Effect in the Past 50 Years**

Fen Peng, The Hong Kong Polytechnic University, Hong Kong S.A.R., China

#### **10:48 Tracking the spatial evolution of urban heat islands**

Rui Zhu, The Hong Kong Polytechnic University, China

#### **11:06 A probability-based statistical method to extract water body of TM images with missing information**

Jiangping Chen, School of Remote Sensing and Information Engineering, Wuhan University, China

#### **11:24 Spatial-Temporal Dynamics of Urban Fire Incidents: A Case Study Of Nanjing, China**

Jing Yao, University of Glasgow, United Kingdom

#### **11:42 Spatial-temporal detection of changes on the southern coast of the Baltic sea based on multitemporal aerial photographs**

Krystyna Michalowska, The University of Agriculture in Krakow, Poland

### **13/7 10:30 - 12:00 III/1 - Orientation and Surface Reconstruction 1**

Session Chair: Christoph Strecha, Pix4D

Session Co-Chair: Olaf Hellwich, Technical University Berlin



**10:30 Reconstructing white walls: multi-view, multi-shot 3D reconstruction of textureless surfaces**

Andreas Ley, Technische Universität Berlin, Germany

**10:48 Efficient wide baseline structure from motion**

Mario Michelini, Bundeswehr University Munich, Germany

**11:06 Photogrammetric accuracy and modeling of rolling shutter cameras**

Jonas Vautherin, Pix4D, Switzerland

**11:24 Modern Methods of Bundle Adjustment on the GPU**

Ronny Haensch, Technische Universität Berlin, Germany

**11:42 Texture-aware dense image matching using ternary census transform**

Han Hu, Hong Kong Polytechnic University, China

**13/7 10:30 - 12:00 IV/2 - Global Status of Mapping and Geospatial Database Updating**

Session Chair: Gottfried Konecny, Leibniz University Hannover

Session Co-Chair: Vladimir A. Seredovich

**10:30 The current status of mapping in the world - spotlight on Oceania**

John Charles Trinder, University of NSW, Australia

**10:48 Database design and construction of massive digital orthophoto maps in China**

Mei Yang, National Geomatics Center of China, China

**11:06 Information Extraction and Dependency on Open Government Data (OGD) for Environmental Monitoring**

Hussein M Abdulmuttalib, Dubai Municipality, United Arab Emirates

**11:24 An automatic uav mapping system for supporting un (united nations) field operations**

Kyoungah Choi, University of Seoul, Korea

**11:42 eServices linked with the Czech**

**Cadastre of Real Estate**

Jiří Poláček, Czech Office for Surveying, Mapping and Cadastre, Czech Republic

**13/7 10:30 - 12:00 IV/SpS 12 - EuroSDR: Innovative technologies and methodologies for NMCAs“ 1**

Session Chair: André Streilein, Swiss Federal Office of Topography

**10:30 Automated generalisation within NMAs**

Jantien Stoter, TU Delft, The Netherlands

**10:48 High Density Aerial Image Matching: State-of-the-art and future prospects**

Norbert Haala, University of Stuttgart, Germany

**11:06 Changing the Production Pipeline - Use of Oblique Aerial Cameras for Mapping Purposes**

Kjersti Moe, Terra Messflug, Austria

**11:24 Oblique Aerial Imagery for NMA – Some Best Practices**

Fabio Remondino, FBK Trento, Italy

**13/7 10:30 - 12:00 V/2 - Cultural Heritage Data Acquisition and Processing: 3D modeling strategies**

Session Chair: Dimitrios P. Skarlatos, Cyprus University of Technology

Session Co-Chair: Javier Cardenal, University of Jaen

**10:30 Analysis, thematic maps and data mining from point cloud to ontology for software development**

Romina Nespeca, DICEA, Polytechnic University of Marche, Ancona, Italy

**10:48 Inspection of a medieval wood sculpture using computer tomography**

Kristof Kapitany, BME, Dept. of Photogrammetry and Geoinformatics, Hungary

**11:06 Complementarity of historic building information modelling and geographic information systems**

Xiucheng Yang, University of Strasbourg, France

**11:24 Automated voxel model from point clouds for structural analysis of cultural heritage**

Ilenia Selvaggi, University of Bologna, Italy

**11:42 A Semi-Automated Point Cloud Processing Methodology For 3D Cultural Heritage Documentation**

Cemal Özgür Kivilcim, Istanbul Metropolitan Municipality, Turkey

**13/7 10:30 - 12:00 VII/5 - Methods for Change Detection and Process Modelling 1**

Session Chair: Georg Bareth, University of Cologne

Session Co-Chair: Guido Waldhoff, University of Cologne

**10:30 Monitoring vegetation phenology of grassland and herbaceous vegetation with UAV imagery**

Wimala van Iersel, Utrecht University, The Netherlands

**10:48 Monitoring tree population dynamics in arid zone through multiple temporal scales: integration of spatial analysis, change detection and field long term monitoring**  
Sivan Isaacson, Ben-Gurion University of the Negev, Israel

**11:06 Using remote sensing and GIS techniques to detect changes to the Prince Alfred Hamlet conservation area in the Western Cape, South Africa**

Patricia Duncan, Dept Rural Development and Land Reform, South Africa

**11:24 Analysis of landslides based on displacements of lines**

Antonio Mozas-Calvache, University of Jaén, Spain

**11:42 A new IDL implementation of the Jupp method for bathymetry extraction in shallow waters**

Antonio Pala, University of Cagliari, Italy

**13/7 10:30 - 12:00 VIII/ThS 2 - Operational Remote Sensing Application Services 1**

Session Chair: Shailesh Nayak, Earth System Science Organisation

Session Co-Chair: MVR Sai

**10:30 Using Multi-Dimensional Microwave Remote Sensing Information for The Retrieval of Soil Surface Roughness Across Scales**

Philip Marzahn, Ludwig-Maximilians-University, Germany

**10:48 Study of Automatic Image Rectification and Registration of Scanned Historical Aerial Photographs**

Hou-Ren Chen, National Cheng Kung University, Taiwan

**11:06 Forecasting and monitoring agricultural drought in the Philippines**

Gay Jane Perez, University of the Philippines Diliman, Philippines

**11:24 Whirl Wind Detection and Identification in Indonesia Utilizing Single Polarization Doppler Weather Radar Volumetric Data**

Abdullah Ali, Indonesian Agency for Meteorology Climatology and Geophysics / Indonesian State College of Meteorology Climatology and Geophysics, Indonesia

**11:42 RSGCPs - Remotely Sensed Ground Control Points**

Philipp Hummel, CompassData, USA

**13/7 13:30 - 14:30 Commercial session II**

**13:30 Hexagon, Leica**

John Welter, President GSD Nils Thoss, UAV/Aibotix

Alessandro Nuzzo, Mobile Mapping/Pegasus

**13/7 13:30 - 15:00 I/SpS 9 - GALILEO and COPERNICUS: geospatial and land applications and services**

Session Chair: Stratos Stylianidis, Geolmaging Ltd

Session Co-Chair: Hans Dufourmont, European Environment Agency

Session Co-chair: Reinhard Blasi

**13:30 Copernicus – practice of daily life of a national mapping agency?**

Michael Hovenbitzer, Federal Agency for Cartography and Geodesy, Germany

**13:48 Synthetic Aperture Radar (SAR) based classifier for land applications in Germany**  
Gopika Suresh, Federal Agency for Cartography and Geodesy, Germany

**14:06 Sensors for location-based Augmented Reality - the example of Galileo and EGNOS**

Alain Pagani, German Research Center for Artificial Intelligence DFKI, Germany

**14:24 Europe's Copernicus and Galileo satellite-based systems: applications for photogrammetry and remote sensing**  
European GNSS Agency, Czech Republic

**14:42 LBS Augmented Reality Assistive System for Utilities Infrastructure Management Through Galileo and EGNOS**  
Efstratios Stylianidis, Geolmaging Ltd, Cyprus

**13/7 13:30 - 15:00 I/Vb - Unmanned Vehicle System (UVS): Sensors and Applications 1**

Session Chair: Jan Skaloud, EPFL  
Session Co-Chair: Dorota A. Grejner-Brzezinska, The Ohio State University

**13:30 Integration of image-derived and POS-derived features for image blur detection**  
Tee-Ann Teo, National Chiao Tung University, Taiwan

**13:48 Integration of a building model into the image based orientation of UAV flights**  
Jakob Unger, Leibniz Universität Hannover, Germany

**14:06 Cooperative UAS localization using low cost sensors**  
Salil Goel, The University of Melbourne, Australia; Indian Institute of Technology Kanpur, India

**14:24 mapKITE: a new paradigm for simultaneous aerial and terrestrial geodata acquisition and mapping**  
Ismael Colomina, GeoNumerics, Spain

**14:42 Augmenting ViSP's 3d model-**

**based tracker with RGB-D SLAM for pose estimation in indoor environments**  
Julien Li-Chee-Ming, York University, Canada

**13/7 13:30 - 15:00 II/1 - Spatio-temporal Modelling 2**

Session Chair: Wenzhong John Shi, The Hong Kong Polytechnic University  
Session Co-Chair: Bo Wu, The Hong Kong Polytechnic University

**13:30 Compression and Progressive Retrieval of Multi-Dimensional Sensor Data**  
Peter Lorkowski, Jade University Wilhelmshaven/Oldenburg/Elsfleth, Germany

**13:48 Airborne light detection and ranging (lidar) derived deformation from the mw 6.0 24 august, 2014 south napa earthquake estimated by two and three dimensional point cloud change detection techniques**  
Craig, University of Houston, USA

**14:06 Determining Spatio-Temporal Cadastral Data Requirement for Infrastructure of LADM for Turkey**  
Mehmet Alkan, Yildiz Technical University, Turkey

**14:24 Evaluation of multi-temporal percent tree cover data for detection of forest degradation**  
Yan Gao, UNAM, Mexico

**14:42 Causal analysis of forest vegetation response to environmental variables during pre- and post-monsoon seasons in western Himalayan region of India**  
Sanjay Kumar Ghosh, Indian Institute of Technology (IIT) Roorkee, India

**13/7 13:30 - 15:00 IV/1 - Methods for the Update and Verification of Geospatial Databases 1**

Session Chair: David Anthony Holland, Ordnance Survey  
Session Co-Chair: Penglin Zhang, Wuhan University

**13:30 True ortho generation of urban area**  
Yong Hu, PCI Geomatics, Canada

**13:48 Comparison of open source compression algorithms on VHR remote**

## sensing images for efficient storage hierarchy

Alper Akoguz, Center for Satellite Communications and Remote Sensing, ITU, Turkey

**14:06 Analysis of Influence of Terrain Relief Roughness on DEM Accuracy generated from LIDAR in the Czech Republic Territory**  
Vladimír Kovařík, University of Defence, Czech Republic

**14:24 Detection of Orthoimage Mosaicking Seamlines by Means of Wavelet Transformation**  
Krystian Pyka, AGH University, Poland

## 13/7 13:30 - 15:00 V/5 - Close-range Measurements for Biomedical Sciences and Geosciences 1

Session Chair: Vladimir Knyaz, State Research Institute of Aviation Systems (GosNIIAS)

Session Co-Chair: Jim Chandler, Loughborough University

**13:30 Automated Photogrammetric Measurements of Teeth for Occlusion Analysis**

Armen Gaboutchian, State Research Institute of Aviation Systems (GosNIIAS), Russian Federation

**13:48 Toward the Automatic Calibration of Dual Fluoroscopy Imaging Systems**  
Kaleel Al Durgham, University of Calgary

**14:06 Photogrammetric 3D acquisition and analysis of medicamentous induced “goose bumps”**  
Danilo Schneider, Technische Universität Dresden, Germany

**14:24 Patient registration using photogrammetric reconstruction from smartphone imagery**  
Olaf Hellwich, Technical University Berlin, Germany

## 13/7 13:30 - 15:00 VI/1 - Web-based Resource Sharing for Education and Collaborative Research

Session Chair: Huayi Wu, Wuhan University  
Session Co-Chair: Zhipeng Gui, Wuhan University

**13:30 Spec Tool; an online education and research resource**  
Shimrit Maman, Ben-Gurion University of the Negev, Israel

**13:48 Developing a cloud-based online geospatial information sharing and geoprocessing platform to facilitate collaborative education and research**  
Zhipeng Gui, Wuhan University, China

**14:06 Mapping Landslides in Lunar Impact Craters Using Chebyshev Polynomials and DEM's**  
Marco Scaioni, Politecnico di Milano, Italy

**14:24 Framework See-Think-Do as a Tool for Crowdsourcing Support – Case Study on Crisis Management**  
Rostislav Netek, Palacký University Olomouc, Czech Republic

## 13/7 13:30 - 15:00 VII/4 - Methods for Image Classification 1

Session Chair: Julian Smit, University of Cape Town

Session Co-Chair: Przemysław Kupidura, Warsaw University of Technology

**13:30 Mapping crops from a sequence of TerraSAR-X images with dynamic conditional random fields**  
Benson Kipkemboi Kenduiywo, Technische Universität Darmstadt, Germany

**13:48 Unsupervised Wishart classification of wetlands in Newfoundland, Canada using PolSAR data based on Fisher linear discriminant analysis**  
Bahram Salehi, 1C-CORE and Memorial University of Newfoundland, Canada

**14:06 A fuzzy logic-based approach for the detection of flooded vegetation by means of Synthetic Aperture Radar data**  
Viktoriya Tsyganskaya, Ludwig Maximilians University Munich, Germany

**14:24 Multiscale segmentation of**



polarimetric SAR image based on SRM superpixels

Fengkai Lang, China University of Mining and Technology, China

**14:42** SAR image segmentation with unknown number of classes combined Voronoi tessellation and RJMCMC algorithm  
Quanhua Zhao, Liaoning technical university, China

**13/7 13:30 - 15:00 VIII/Ths 2 - Operational Remote Sensing Application Services 2**

Session Chair: Darshana R Rawal, CEPT University

**13:30** Precise ortho imagery as the source for authoritative airport mapping  
Hayden Howard, CompassData, Inc., Centennial, USA

**13:48** Volumetric Forest Change Detection through VHR Satellite Imagery  
Konstantinos Smagas, Geolmaging Ltd

**14:06** Overland flow analysis using time series of sUAS-derived elevation models  
Justyna Jeziorska, University of Wrocław, Poland, North Carolina State University

**14:24** An Application of Close-up Photogrammetry in Viticulture  
Maria Grazia D'Urso, University of Cassino and Southern Lazio, Italy

**14:42** Image-based airborne LiDAR point cloud encoding for 3D building model retrieval  
Yi-Chen Chen, National Cheng Kung University, Taiwan

**13/7 15:00 - 16:00 Commercial session III**

**15:00** Beijing Geoway - High precision geometry processing technology of large scale optical satellite image and its applications  
Mi Wang, Wuhan University, China

**15:30** Beijing Geoway - Real-time hi-resolution image processing technology  
Yuanzheng Shao, Wuhan GEOWAY Geospatial I&T Research Institute, Beijing GEOWAY Software Co., Ltd., China

**13/7 15:00 - 16:30 Interactive session**

(I/2, I/Vb, II/1, III/1, III/3, IV/2, V/3, VII/5, ThS16)

**I/2 - LiDAR, SAR and Optical Sensors for Airborne and Spaceborne Platforms**

**New Microwave-Based Missions Applications for Rainfed Crops Characterization**

*Nilda Sanchez, Universidad de Salamanca*

**Wavelength selection of hyperspectral LiDAR based on feature weighting for estimation of leaf nitrogen content in rice**  
*Lin Du, Wuhan University, China*

**Application of time series InSAR technique for deformation monitoring of large-scale landslides in mountainous areas of Western China**  
*Tengteng Qu, Tongji University, China*

**Verification of Potency of Aerial Digital Oblique Cameras for Aerial Photogrammetry**

*Ryuji Nakada, Asia Air Survey Co. Ltd, Japan*

**The effective of different excitation wavelengths on the identification of plant species based on fluorescence LiDAR**  
*Jian Yang, Wuhan University, China*

**Application of LiDAR data to assess the landslide susceptibility map using weights of evidence method – an example from Podhale region (Southern Poland)**  
*Miroslaw Kamiński, Polish Geological Institut, Poland*

**Study on the Explainable Ability by Using Airborne Lidar in Tree Canopy and Stand Competition**

*Shangchuan Huang, National Pingtung University of Science and Technology, Taiwan*

**Object-based analysis of lidar geometric features for vegetation detection in shaded areas**

*Yu-Ching Lin, National Defense University, Taiwan*

**Mangrove forest cover extraction of the coastal areas of negros occidental, western visayas, philippines using lidar data**

*Florencio Puno Campomanes, University of the Philippines Cebu Phil-LiDAR 2, Philippines*

**Assessment of four typical topographic corrections in Landsat TM data for snow cover areas**

*He Jiang, University of Electronic and Science Technology of China, China*

**Horizontal Position Optimal Solution Determination for the Satellite Laser Ranging Footprints Based on the Slope Model**

*Yu Wang, Xi'an Surveying and Mapping Institute, China*

**A Segment-Based Approach for DTM Derivation of Airborne LiDAR Data**

*Jie Jang, National Geomatics Center of China, China*

**I/Vb - Unmanned Vehicle Systems (UVS): Sensors and Applications**

**The possibility of using images obtained from the UAS in the works concerning the land and buildings registration**

*Zdzisław Kurczyński, Warsaw University of Technology, Poland*

**Robust mosaicking of UAV images with narrow overlaps**

*Jae-In Kim, Inha University, Korea*

**Chosen aspects of the production of the basic map using UAV imagery**

*Damian Wierzbicki, Military University of Technology, Poland*

**RPAS accuracy testing for using it in the cadastre of real estates of the Czech Republic**

*Eliška Housarová, Czech Technical University in Prague, Czech Republic*

**UAV multispectral survey to map soil and crop for precision farming applications**

*Giovanna Sona, Politecnico di Milano, Italy*

**Calibration of low cost rgb and nir uav cameras**

*Anna Sylwia Fryskowska, Military University of Technology, Poland*

**Classical Photogrammetry and UAV – Selected Aspects**

*Slawomir Mikrut, AGH University of Science and Technology, Poland*

**Unmanned aerial vehicle use for wood chips pile volume estimation**

*Martin Mokroš, Technical University in Zvolen, Slovak Republic*

**Volume computation of a stockpile - a study case, comparing GPS and UAV measurements in open pit quarry**

*Paulina Lyubenova Raeva, University of Architecture, Civil Engineering and Geodesy, Bulgaria*

**Dense 3D Point Cloud Generation from UAV Images from Image Matching and Global Optimazation**

*Sooahm Rhee, DLabs, Korea*

**Novel approach for estimating nitrogen content in paddy fields using low altitude remote sensing system**

*Mohammadmehdi Saberioon, University of South Bohemia in Ceske Budejovice, Czech Republic*

**Archaeological documentation of a defunct Iraqi town**

*Jaroslav Šedina, Czech Technical University in Prague, Czech Republic*

**The Evaluation of GPS and RTK techniques for UAV-based Photogrammetry in Urban Area**

*Mei Ling Yeh, Feng Chia University, Taiwan*

**Methodology for determining optimal exposure parameters of a hyperspectral scanning sensor**

*Piotr Walczykowski, Military University of Technology, Poland*

**Budget UAV-systems for the prospection of small- and medium-scale archaeological sites**

*Wojciech Ostrowski, Warsaw University of Technology, Poland*

**Experiences of UAV Surveys applied to the Cultural Heritage and Environmental Risk Management**

*Mauro Caprioli, Politecnico di Bari, Italy*

**Wetland Assessment Using Unmanned Aerial Vehicle (UAV) Photogrammetry**

*Marinus Axel Boon, University of Johannesburg, South Africa*

**Delines for Authors Preparing Manuscripts for Publication in the ISPRS Archives and the ISPRS Annals Research on the Key Technology of DLG Production Based on Low-Altitude and Large-Scale Photogrammetry**

*Su guozhong, Shanxi province Basic Geographic Information Institute*

**Configuration and specifications of an unmaned aerial vehicle for precision agriculture**

*Manuel Erena, IMIDA, Spain*

**UAV Onboard GPS in Positioning Determination**

*Khairul Nizam Tahar, Universiti Teknologi MARA, Malaysia*

**Remote sensing from unmanned aerial vehicles for oil spill and red tide detection**

*Anna Klimkowska, University of Seoul, Korea*

**Two-step camera calibration method developed for micro UAV's**

*Mateo Gašparović, University of Zagreb, Croatia*

**Unmanned aerial vehicle**

*Ivana Čermáková, University of Pardubice, Czech Republic*

**3D Building Reconstruction By Multiview Images And The Integrated Application With Augmented Reality**

*Jin-Tsong Hwang, National Taipei University, Taiwan*

**II/1 - Spatio-temporal Modelling**

**Spectral Color Indices Based Geospatial Modeling of Soil Organic Matter in Chitwan District, Nepal**

*Umesh Kumar Mandal, Tribhuvan University*

**III/1 - Orientation and Surface Reconstruction**

**Next-Best-View Method Based On Consecutive Evaluation Of Topological Relations**

*Kai Dierenbach, Karlsruhe Institute of Technology, Germany*

**Volume based DTM generation from very high resolution photogrammetric DSMs**

*Björn Piltz, DLR, Germany*

**Towards Object Driven Floor Plan Extraction from Laser Point Cloud**

*Kivanc Babacan, York University, Canada*

**Analyzing rcd30 oblique performance in a production environment**

*Maria Eulalia Soler, Institut Cartogràfic i Geològic de Catalunya, Spain*

**Performance Evaluation of Alternative Relative Orientation Procedures for UAV-based Imagery with Prior Flight Trajectory Information**

*Ayman Habib, Purdue University, USA*

**Pose estimation and mapping using catadioptric cameras with spherical mirrors**

*Sagi Filin, Technion - Israel Institute of Technology, Israel*

**Quality analysis of realistic 3D surface reconstruction using low-cost UAV-borne and terrestrial photogrammetric systems**

*Zahra Lari, University of calgary, Canada*

**An optimised system for generating multi-resolution DTMs using NASA MRO datasets**

*Yu Tao, University College London, United Kingdom*

**Structured light based 3D scanning for specular surface by the combination of gray code and phase shifting**

*Alper Yilmaz, The Ohio State University, USA*

**The new approach towards the camera calibration – gcp's or tls data?**

*Michał Kowalczyk, Warsaw University of Technology, Poland*

**Orientation modeling for amature cameras by matching image line features and building vector data**

*C. H. Hung, National Central University, Taiwan*

**Single image camera calibration in close**

**range photogrammetry for solder joint analysis**

*David Heinemann, Technische Universität Ilmenau, Germany*

**Image Network Generation of Uncalibrated UAV Images With Low-Cost GPS Data**

*Shan Huang, Wuhan University, China*

**Dense Image Matching With Two Steps of Expansion**

*Zuxun Zhang, Wuhan University, China*

**Exterior orientation estimation of oblique aerial imagery using vanishing points**

*Styliani Verykokou, National Technical University of Athens*

**Fast radiometry guided fusion of disparity images**

*Stephan Schmid, Daimler AG, Germany*

**Preparation of the digital elevation model for Orthophoto CR production**

*Zdeněk Švec, CTU in Prague, Czech Republic*

**Stereo reconstruction of atmospheric cloud surfaces from fish-eye camera images**

*Gabor Katai-Urban, Kecskemet College, Hungary*

**Automatic kappa angle estimation for air photos based on phase only correlation**

*Yubin Xin, PCI Geomatics, Canada*

**3D Building Reconstruction Using Dense Photogrammetric Point Cloud**

*Shirin Malihi, Khaje Nasir Toosi University of Technology, Iran*

**A new rfm optimized model of high-resolution satellite imagery**

*Chang Li, Central China Normal University, China*

**III/3 - Image Sequence Analysis**

**Cloud Removal from Sentinel-2 Image Time Series through Sparse Reconstruction from Random Samples**

*Jakub Bieniarz, DLR, Remote Sensing Technology Institute, Germany*

**DEM Reconstruction Using Light Field**

**and Bidirectional Reflectance Function from Multi-View High Resolution Spatial Images**

*François de Vieilleville, MAGELLIUM SAS, France*

**Pedestrian detection by laser scanning and depth imagery**

*Arpad Barsi, Budapest University of Technology and Economics, Hungary*

**Optimal image stitching for concrete bridge bottom surfaces aided by 3d structure lines**

*Yahui Liu, Wuhan University, P.R. China*

**Continuous Mapping of Tunnel Walls in a GNSS\_Denied Environment**

*Michael Alastair Chapman, Ryerson University, Canada*

**Enhancement strategies for frame-to-frame stereo visual odometry**

*Jens Kersten, Bauhaus-Universität Weimar, Germany*

**Estimating reliability of disturbances in satellite time series data based on statistical analysis**

*Ping Tang, Institute of Remote Sensing and Digital Earth (RADI), CAS, China*

**Hybrid-based dense stereo matching**

*Tzu-Yi Chuang, National Taiwan University, Taiwan*

**An aerial image dense matching method based on optical flow field**

*Wei Yuan, Wuhan University, China; University of Tokyo, Japan*

**Mutual Comparative Filtering for Change Detection in Videos with Unstable Illumination Conditions**

*Boris Vaisovich Vishnyakov, FGUP GosNIIAS, Russian Federation*

**Automatic Detection of Clouds and Shadows Using High Resolution Satellite Image Time Series**

*Nicolas Champion, IGN, France*

**Analysis of the segmented features of indicator of mine presence**

*Andrija Krtalic, Faculty of Geodesy University of Zagreb, Croatia*



#### **IV/2 - Global Status of Mapping and Geo-spatial Database Updating**

##### **Research on the Ancient Mongolian Place-name along the Silk Road**

*Nashunwuritu, Inner Mongolia University, China*

##### **Nonzonal expressions of Gauss- Krüger projection in polar regions**

*Zhongmei Li, Naval University of Engineering, China*

#### **V/3 - Terrestrial 3D Imaging and Sensors**

##### **Study on Improvement of Accuracy in Inertial Photogrammetry by Combining Images with Inertial Measurement Unit**

*Hideaki Kawasaki, Tokyo Metropolitan Government Bureau of Port and Harbor, Japan*

##### **Development of a novel system to measure a clearance of a passenger platform**

*Masato Shimizu, Kokusai Kogyo Co., Ltd., Japan*

##### **Towards the influence of a car windshield on depth calculation with a stereo camera system**

*Alexander Hanel, Technische Universitaet Muenchen, Germany*

##### **Experimental assessment of the Quanergy M8 lidar sensor**

*Jean-Emmanuel Deschaud, MINES ParisTech, PSL Research University, Centre for robotics, France*

##### **Detection of Slope Movement by Comparing Point Clouds Created by SfM Software**

*Kazuo Oda, Asia Air Survey Co., Ltd, Japan*

##### **Geomorphological mapping with terrestrial laser scanning and UAV based imaging**

*Nora Tilly, University of Cologne, Germany*

##### **Accuracy Assessment of Go Pro Hero 3 (Black) Camera in Underwater Environment**

*Petra Helmholz, Curtin University, Australia*

##### **Calibration of a Multi-Camera Rover**

*Ansgar Brunn, University of Applied Sciences Würzburg-Schweinfurt, Germany*

##### **Terrestrial Laser Scanner for Monitoring the Deformations and the Damages of Buildings**

*Giuseppina Vacca, University of Cagliari, Italy*

##### **Photogrammetric techniques for road surface analysis**

*Vladimir Knyaz, State Research Institute of Aviation Systems (GosNIIAS), Russia*

##### **Automatic Railway Power Line Extraction Using Mobile Laser Scanning Data**

*Shanxin Zhang, Xiamen University, China; Xizang Minzu University, China*

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

##### **Trajectory-based change detection of urban land-cover**

*Yanghua Zhang, Beijing Normal University, China*

##### **Detection of Harbours from High Resolution Remote Sensing Imagery via Saliency Analysis and Feature Learning**

*Yetianjian Wang, Wuhan University, China*

##### **An Unsupervised Change Detection Based on Test Statistic and KI from Multitemporal and Full Polarimetric SAR Images**

*Jinqi Zhao, Wuhan University, China*

##### **An approach to alleviate the false alarm in building change detection from urban VHR image**

*Jie Chen, Central South University, China*

##### **Object-Oriented Change Detection for Remote Sensing Images Based on Multi-Scale Fusion**

*Haigang Sui, Wuhan University, China*

##### **Land cover change detection using saliency and wavelet transformation**

*Haopeng Zhang, Beihang University; Beijing Key Laboratory of Digital Media*

##### **Ground deformation extraction using visible images and LiDAR data in mining Area**

*Lixin Wu, China University of Mining and*

*Technology, Xuzhou, China*

## **Comparison of Pixel-Based and Object-Oriented Land Cover Change Detection Methods**

*Ling Zhu, Beijing University of Civil Engineering and Architecture, China*

## **Monitoring soil moisture in a coal mining area with multi-phase Landsat images**

*Jinling Kong, Chang'an University, P. R. China; Ministry of Education, P. R. China*

## **Updating national topographic database using change detection methods**

*Eran Keinan, Survey of Israel, Israel*

## **Change Detection Based On Objects**

*Ming ting Zhou, Wuhan University, China*

## **A kernel-based similarity measuring for change detection in remote sensing images**

*Xiaodan Shi, Wuhan University, China*

## **ThS 16 - Perceptual and cognitive experiments with imagery and 3D models**

### **Eye Tracking to Explore the Impacts of Photorealistic 3D Representations in Pedestrian Navigation Performance**

*Weihua Dong, Beijing Normal University, China*

### **Comparison of User Performance with Interactive and Static 3D Visualization – Pilot Study**

*Lukas Herman, Masaryk University*

### **Evaluation of the user strategy on 2D and 3D city maps based on novel scanpath comparison method and graph visualization**

*Jitka Doležalová, Palacký University Olomouc*

### **On-Line Change Monitoring with Transformed Multi-Spectral Time Series, a Study Case in Tropical Forest**

*Meng Lu, University of Muenster, Germany*

## ***Rescheduled interactive presentations***

### **The usage of rusboost boosting method for classification of impervious surfaces**

*Mustafa Hayri Kesikoglu, University of Erciyes*

## **13/7 16:30 - 17:30 Commercial session IV**

### **16:30 Blue Marble Geographics - LiDAR Processing with Global Mapper**

Patrick Cunningham, Blue Marble Geographics, USA

## **13/7 16:30 - 18:00 I/Vb - Unmanned Vehicle Systems (UVS): Sensors and Applications 2**

Session Chair: Eija Honkavaara, Finnish Geospatial Research Institute

Session Co-Chair: Michael Cramer, Universität Stuttgart

### **16:30 Traffic light detection using conic section geometry**

Alper Yilmaz, The Ohio State University, USA

### **16:48 Toward Real Time UAV s' Image Mosaicking**

Sina Mehrdad, University of Isfahan, Iran

### **17:06 Evaluation of the quality of action cameras with wide-angle lenses in UAV photogrammetry**

Heidi Hastedt, Jade University of Applied Sciences, Germany

### **17:24 UAV photogrammetry with oblique images: first analysis on data acquisition and processing**

Nives Grasso, Politecnico di Torino, Italy

## **13/7 16:30 - 18:00 II/ThS 16 - Perceptual and cognitive experiments with imagery and 3D models**

Session Chair: Arzu Coltekin, University of Zurich

Session Co-Chair: Christopher James Pettit, UNSW Australia

### **16:30 Navigation simulation with virtual 3d geovisualizations - A focus on memory related factors**

Ismini-Eleni Lokka, University of Zurich, Switzerland

### **16:48 Spatial cognition in tangible computing**

Brendan Alexander Harmon, North Carolina State University

**17:06 Analysis of visual interpretation of satellite data**

Hana Svatonova, Masaryk University, Czech Republic

**17:24 Understanding human perception of building categories in virtual 3D cities - a user study**

Patrick Tutzauer, University of Stuttgart, Germany

**17:42 Cognitive aspects of collaboration in 3D virtual environments**

Lukáš Herman, Masaryk University, Czech Republic

**13/7 16:30 - 18:00 III/3 - Image Sequence Analysis 1**

Session Chair: Alper Yilmaz, Ohio State University

Session Co-Chair: Yury Vizilter, State Research Institute of Aviation Systems (GosNIIAS)

**16:30 Image stitching with perspective-preserving warping**

Tianzhu Xiang, Wuhan University, China

**16:48 Detecting anomaly regions in satellite image time series based on seasonal autocorrelation analysis**

Ping Tang, Chinese Academy of Sciences (CAS), China

**17:06 Measurement and Analysis of Gait by Using a Time-of-Flight Camera**

Cihan Altuntas, Selcuk University, Turkey

**17:24 A gaussian process based multi-person interaction model**

Tobias Klinger, Leibniz Universität Hannover, Germany

**13/7 16:30 - 18:00 IV/SpS 12 - EuroSDR: Innovative technologies and methodologies for NMCAs“ 2**

Session Chair: Fabio Remondino, FBK Trento

**16:30 TrueDOP - a new quality step for official orthophotos**

Sven Baltrusch, Landesamt für innere Verwaltung Mecklenburg-Vorpommern, Germany

**16:48 EuroSDR – the pan-european network for mapping agencies and academia**

André Streilein, Swiss Federal Office of Topography, Wabern, Switzerland

**17:06 State-of-the-art of 3D national mapping and remaining research issues**

Maria Pla, ICGC, Catalonia

**17:24 EuroSDR educational services for continuing professional development**

Markéta Potůčková, Charles University in Prague, Czech Republic

**13/7 16:30 - 18:00 V/3 - Terrestrial 3D Imaging and Sensors 1**

Session Chair: Marco Scaioni, Politecnico di Milano

Session Co-Chair: Danilo Schneider, Technische Universität Dresden

**16:30 Model Based Viewpoint Planning for Terrestrial Laser Scanning from an Economic Perspective**

Daniel Wujanz, Technische Universität Berlin, Germany

**16:48 Improved Real-Time Scan Matching Using Corner Features**

Haytham Alaa Mohamed, University of Calgary, Canada

**17:06 Automatic thickness and volume estimation of sprayed concrete on anchored retaining walls from terrestrial LiDAR data**

Joaquín Martínez-Sánchez, University of Vigo, Spain, Ingeniería Insitu, Spain

**17:24 Speeding up coarse point cloud registration by threshold-independent BaySAC match selection**

Zhizhong Kang1, China University of Geosciences, China

**17:42 Fine registration of kilo-stations networks - a modern procedure for TLS datasets**

Jean-François Hullo, Electricité de France, France

**13/7 16:30 - 18:00 VII/4 - Methods for Image Classification 2**

Session Chair: Peijun Li, Peking University

Session Co-Chair: Taskin Kavzoglu, Gebze

Technical University

**16:30 Multiple reflection effects in nonlinear mixture model for hyperspectral image analysis**

Hsuan Ren, National Central University, Taiwan

**16:48 Parallel Implementation of Morphological Profile Based Spectral-Spatial Classification Scheme for Hyperspectral Imagery**

Brajesh Kumar, MJP Rohilkhand University, India

**17:06 Investigation of Latent Traces Using Infrared Reflectance Hyperspectral Imaging**

Till Schubert, University of Bonn, Germany

**17:24 A Diversified Deep Belief Network for Hyperspectral Image Classification**

Ping Zhong, National University of Defense Technology, China

**17:42 Detection of Disease Symptoms on Hyperspectral 3D Plant Models**

Ribana Roscher, Freie Universität Berlin, Germany

**13/7 16:30 - 18:00 VIII/1 - Disaster and Risk Reduction 1**

Session Chair: T. Srinivasa Kumar, INCOIS

Session Co-Chair: Ni Made Pertiwi Jaya, Yamaguchi University

**16:30 Feasibility study of inexpensive FLIR sensors and small UAV deployment for living vs. non-living human detection in rescue missions application scenarios**

Eugene Levin, Michigan Technological University, USA

**16:48 Dike monitoring by the means of persistent scattering interferometry at the coast of northern germany**

Moritz Seidel, Ludwig-Maximilians-Universität München, Germany

**17:06 Influence of DEM in Watershed Management as Flood Zonation Mapping**

Mudasir Khan, MOMRA, Saudi Arabia

**17:24 Estimation of insulator contaminations by means of remote sensing technique**

Ge Han, Wuhan University, China

**13/7 16:30 - 18:00 VIII/Ths 2 - Operational Remote Sensing Application Services 3**

Session Chair: Vinay Kumar Dadhwal, Indian Space Research Organisation

Session Co-Chair: Philip Marzahn, Ludwig-Maximilians-University

**16:30 Application of GIS and Groundwater Modelling Techniques to Identify the Perched Aquifers to Demarkate Water Logging Conditions in Parts of Mehsana District, Gujarat, India**

Darshana R Rawal, CEPT University, India

**16:48 Mapping spatial moisture content of unsaturated agricultural soils with ground-penetrating radar**

Omer Shamir, Tel Aviv University, Israel; Israel Ministry of Agriculture; 3Geo-Sense Ltd, Israel

**17:06 Comparison of high and low density airborne lidar data for forest road quality assessment**

Katalin Kiss, University of Eastern Finland, Finland

**17:24 Assessing the impacts of flooding caused by extreme rainfall events through a combined geospatial and numerical modeling approach**

Arthur Amora, Caraga State University, Philippines



# 6

PROGRAM XXIII ISPRS  
THURSDAY 14 JULY





Thursday, 14 July, 2016

TIME	LOCATION	SESSION
08:30 - 10:00	Club A	I/3 - Multi-Platform Multi-Sensor System Calibration 1
	Club B	I/ThS 11 - Unmanned Aerial Systems: The Roadmap from Research to Applications 1
	Club C	II/2 - Multiscale n-dimensional Spatial Data Representations, Data Structures and Algorithms 1
	Meeting Hall IV	III/2 - Point Cloud Processing 1
	Club D	IV/3 - Global DEM Interoperability 1
	Meeting Hall I A	SAF - SA1 Perspectives on International Earth Observation Missions
	Meeting Hall I B	NMCAF - SN1 Imagery for national tasks
	Meeting Hall V	VII/4 - Methods for Image Classification 3
	Club E	VIII/1 - Disaster and Risk Reduction 2
08:30 - 18:00	Meeting Room 2.2	CATCON
10:30 - 12:00	Club B	I/3 - Multi-Platform Multi-Sensor System Calibration 2
	Club C	II/2 - Multiscale n-dimensional Spatial Data Representations, Data Structures and Algorithms 2
	Club H	III/4 - 3D Scene Analysis 1
	Club D	IV/4 - Geospatial Data Infrastructure 1
	Meeting Hall I A	SAF - SA2 Remote sensing for environmental monitoring and societal benefit
	Meeting Hall I B	NMCAF - SN2 3-dimensional geoinformation
	Club E	SpS13 - FIG's contributions to the Geo-Spatial Society
	Meeting Hall IV	V/2 - Cultural Heritage Data Acquisition and Processing: Image based survey for CH
	North Hall	VII/4 - Methods for Image Classification 4
	Meeting Hall V	VIII/1 - Disaster and Risk Reduction 3
	Club A	VIII/2 - Health 1

13:30 - 15:00	Club H	I/5 - Satellite Systems for Earth Observation 1
	Club B	I/ThS 11 - Unmanned Aerial Systems: The Roadmap from Research to Applications 2
	Club C	IV/7 - 3D Indoor Modelling and Navigation 1
	Meeting Hall I A	SAF - SA3 New Earth Observation technologies and applications: The commercial perspective
	Meeting Hall I B	NMCAF - SN3 Geospatial data infrastructures
	Club A	V/1 - Vision Metrology 1
	Club D	VI/2 - E-Delivery of Education Services
	North Hall	VII/6 - Remote Sensing Data Fusion 1
	Meeting Hall IV	VIII/1 - Disaster and Risk Reduction 4
	Meeting Hall V	VIII/2 - Health 2
15:00 - 16:30	Foyer 3rd Floor	Interactive session (I/5, II/2, III/5, IV/8, V/1, V/2, VI/2, VIII/1, VIII/2, ThS11, ThS17, SpS13, SpS14)
15:30 - 17:00	Meeting Hall I A	SAF - SA4 Earth Observation Data Policy and long-term Data Continuity
	Meeting Hall I B	NMCAF - SN4 Quality assessment of geoinformation
16:30 - 18:00	Club E	I/2 - LiDAR, SAR and Optical Sensors for Airborne and Spaceborne Platforms 2
	Club B	II/ThS 17 - Smart Cities
	Club C	III/5 - Computer Graphics and Remote Sensing
	Club H	IV/8 - Planetary Mapping and Spatial Databases 1
	Club D	V/4 - Terrestrial 3D Modelling: Algorithms and Methods 1
	North Hall	VII/6 - Remote Sensing Data Fusion 2
	Meeting Hall IV	VIII/1 - Disaster and Risk Reduction 5

## Thursday 14 July 2016

### 14/7 08:30 - 10:00 I/3 - Multi-Platform Multi-Sensor System Calibration 1

Session Chair: Ayman Habib, Purdue University

Session Co-Chair: Gerhard Kemper, GGS GmbH

#### 08:30 Approach for Improving the Integrated Sensor Orientation

Edson Aparecido Mitishita, Federal University of Parana, Brazil

#### 08:48 A hierarchical solution for sensor localization in noisy and restricted conditions

Shunping JI, Wuhan University, China

#### 09:06 Comparative analysis of different LiDAR system calibration techniques

Ayman Habib, Purdue, USA

#### 09:24 Hybrid online mobile laser scanner calibration through image alignment by mutual information

Bruno Vallet, Université Paris Est - IGN, SRIG, MATIS, France

#### 09:42 Calibration Procedures on Oblique Camera Setups

Balazs Melykúti, GIP, Dr. Kruck Co. GbR

### 14/7 08:30 - 10:00 I/ThS 11 - Unmanned Aerial Systems: The Roadmap from Research to Applications 1

Session Chair: Babak Ameri, GEOSYS Technology Solutions

Session Co-Chair: Costas Armenakis, York University

#### 08:30 Design and implementation of a low-cost UAV-based multi-sensor payload for rapid-response mapping applications

Mostafa Sakr, University of Calgary, Canada

#### 08:48 UAV surveying for a complete mapping and documentation of archaeological findings. The Early Neolithic site of Portonovo.

Roberto Pierdicca, Università Politecnica delle Marche, Italy

#### 09:06 Quality analysis on 3D building models reconstructed from UAV imagery

Małgorzata Jarząbek-Rychard, Mateusz Karpina

#### 09:24 From UAS data acquisition to actionable information – how and end-to-end solution helps oil palm plantation operators to perform a more sustainable plantation management

Christian Hoffmann, Trimble Germany GmbH, Germany

### 14/7 08:30 - 10:00 II/2 - Multiscale n-dimensional Spatial Data Representations, Data Structures and Algorithms 1

Session Chair: Christopher Malcolm Gold, Southwest Jiaotong University

Session Co-Chair: Eric Guilbert, Université Laval

#### 08:30 A Multi-Scale Settlement Matching Algorithm Based on ARG

Han Yue, Wuhan University, China

#### 08:48 Parallel processing of big point clouds using Z-order-based partitioning

Christian Alis, University College London, United Kingdom

#### 09:06 Beyond Maximum Independent Set: An Extended Model for Point-Feature Label Placement

Jan-Henrik Haunert, University of Osnabrück, Germany

#### 09:24 Comparative analysis of data structures for storing massive TINs in a DBMS

Kavisha Kumar, Delft University of Technology, The Netherlands

#### 09:42 Automated Photogrammetric Image Matching With Sift Algorithm and Delaunay Triangulation

Francisc Antón Castro, DTU, Technical University of Denmark

### 14/7 08:30 - 10:00 III/2 - Point Cloud Processing 1

Session Chair: Sander Oude Elberink, University of Twente

Session Co-Chair: Martin Rutzinger, Austrian Academy of Sciences



**08:30** Classification of airborne laser scanning data using geometric multi-scale features and different neighbourhood types  
Martin Weinmann, Karlsruhe Institute of Technology (KIT), Germany

**08:48** Fast Semantic Segmentation of 3D Point Clouds with Strongly Varying Density  
Timo Hackel, ETH Zürich, Switzerland

**09:06** ULS LiDAR supported analyses of laser beam penetration from different ALS systems into vegetation  
Martin Wieser, Technische Universität Wien, Austria

**09:24** Object Classification via Planar Abstraction  
Florent Lafarge, INRIA Sophia Antipolis, France

**09:42** Footprint Map Partitioning Using Airborne Laser Scanning Data  
Biao Xiong, University of Twente, The Netherlands

## 14/7 08:30 - 10:00 IV/3 - Global DEM Interoperability 1

Session Chair: Jan-Peter Muller, UCL Mullard Space Science Laboratory  
Session Co-Chair: Takeo Tadono, Japan Aerospace Exploration Agency

**08:30** ASTER Global DEM Version 3, and new water body dataset  
Michael Abrams, Jet Propulsion Laboratory, USA

**08:48** Validation of the ASTER Global Digital Elevation Model version 3 over the conterminous United States  
Dean Gesch, U.S. Geological Survey, USA

**09:06** Evaluation of ASTER GDEM V3 Using ICESat Laser Altimetry  
Claudia Cristina Carabajal, Sigma Space Corporation @ NASA/GSFC, USA

**09:24** A near-global bare-earth DEM from SRTM  
John Christian Gallant, CSIRO, Australia

**09:42** NASADEM Global Elevation Model: Methods and Progress  
Robert Crippen, California Institute of Technology, USA

## 14/7 08:30 - 10:00 SAF - SA1 Perspectives on International Earth Observation Missions

Session Chair: Gunter Schreier, DLR

**08:30** Welcome address by IAA  
Sandau Rainer, IAA

**08:35** Welcome address by IAF  
Jan Kolar, IAF

**08:40** Making Space for Earth  
Lawrence Friedl, NASA

**09:00** Earth Observation until 2030 - ESA's programme and the Challenges ahead  
Liebig Volker, ESA

**09:20** The Development and Technological Innovation of Chinese Remote Sensing Satellites  
Haiyi Cao, China Academy of Space Technology, China

**09:40** JAXA's Earth observation program and mapping applications  
Yamamoto Shizuo, JAXA

## 14/7 08:30 - 10:00 NMCAF - SN1 Imagery for national tasks

Session Chair: Jantien Stoter, TU Delft

**08:30** Introduction and Welcome  
Gregory Scott, UN-GGIM

**08:35** Image data – the core information source for the tasks of national mapping agencies  
Andy Mc Gill, Ordnance Survey Ireland, Ireland

**08:52** Data from Remote Sensing for Development and Applications of National Mapping in the United States  
Usery Lynn, US Geological Survey, USA

**09:09** Integration of remotely sensed data into Geospatial Reference Information databases. UN-GGIM National approach  
Antonio Arozarena, Instituto Geografico Nacional, Spain

**09:26** Updating Maps Using High Resolution Satellite Imagery  
Khurram Shehzad Janjua, MOMRA, Saudi Arabia

**09:43** How do satellite images impact the

geoinformation updating process at IGN France  
Jean-Phillipe Cantou, IGN Espace

## 14/7 08:30 - 10:00 VII/4 - Methods for Image Classification 3

Session Chair: Weihong Cui, Wuhan University

Session Co-Chair: Mustafa Hayri Kesikoglu, University of Erciyes

### 08:30 Remote Sensing Image Classification Applied to the First National Geographical Information Census of China

Xin Yu, Beijing Institute of Surveying and Mapping, China

### 08:48 A comparison of sub-pixel mapping methods for coastal areas

Qingxiang Liu, University of New South Wales, Australia

### 09:06 Pollen bearing honey bee detection in hive entrance video recorded by remote embedded system for pollination monitoring

Ratko Pilipovic, University of Banja Luka, Bosnia and Herzegovina

### 09:24 Automatic sea bird detection from high resolution aerial imagery

Görres Jochen Grenzdörffer, Rostock University, Germany

### 09:42 Polarimetric SAR data GMM classification base on improved Freeman incoherent decomposition

Mounira Ouarzeddine, USTHB

## 14/7 08:30 - 10:00 VIII/1 - Disaster and Risk Reduction 2

Session Chair: Suzanne Brunke, MDA

Session Co-Chair: Ramji Dwivedi, MNNIT Allahabad

### 08:30 Academe-local government partnership towards effective application of geospatial technologies for smarter flood disaster management at the local level: an example from Mindanao, Philippines

Meriam Makinano-Santillan, Caraga State University, Philippines

### 08:48 Assessment of Flooded Areas Projections and Floods Potential Impacts Applying Remote Sensing Imagery and

### Demographic Data

Daniel Andres Rodriguez, Brazilian Institute for Space Research, Brazil

### 09:06 Rapid Risk Evaluation (ER2) Using Ms Excel Spreadsheet: A Case Study of Fredericton (New Brunswick)

Emmanuel Stefanakis, University of New Brunswick, Canada

### 09:24 Analysis and Remediation of the 2013 Lac Mégantic Train Derailment

Suzanne Brunke, MDA, Canada

### 09:42 3D visualization of volcanic ash dispersion prediction with spatial information open platform in Korea

Junhee Youn, Korea Institute of Civil Engineering and Building Technology, Korea

## 14/7 08:30 - 18:00 CATCON

Session Chair: Gerhard König, Technische Universität Berlin

Session Co-Chair: Anjana Vyas, CEPT University

### Graphos (inteGRated PHOtogrammetric Suite)

Pablo Rodriguez-Gonzalvez, University of Salamanca, Spain

### GeoSquare: a collaborative online geospatial information sharing and geoprocessing platform for education and research

Huayi Wu, Wuhan University, China

### dtwSat: Time-Weighted Dynamic Time Warping for satellite image time series analysis in R

Victor Maus, National Institute For Space Research, Brazil

### HELIOS Sandbox: A User-Friendly Laser Scanning Simulator for Education, Planning and Research of Laser Scanning Operations with Stationary, Ground-Based Mobile and Airborne Platforms

Sebastian Bechtold, Heidelberg University, Germany

### Spatial Decision Support System for Solar Energy

Deepak Kumar, Central University of Karnataka, India

**3D visualization of volcanic ash dispersion prediction with spatial information open platform in Korea**

*Junhee Youn, Korea Institute of Civil Engineering and Building Technology, Korea*

**Learning Photogrammetry with Interactive Software Tool PhoX**

*Thomas Luhmann, Jade University of Applied Sciences, Germany*

**LIME: Interpretation, visualisation and communication of 3D models in geoscience**

*Simon John Buckley, Uni Research AS, Norway*

**Remote sensing paper/ early warning system for earthquakes disaster mitigation in Syria**

*Moutaz Dalati, General Organization for Remote Sensing, Syrian Arab Republic*

**Schistosomiasis: Geospatial Surveillance and Response Systems in Southeast Asia**

*John Brooks Malone, Louisiana State University, USA*

**Typological-Parametric Models for Virtual Reconstruction. Case Study: Merida, Yucatan, Mexico.**

*Antonio Rodriguez, Universidad Anahuac Mayab, Mexico*

**14/7 10:30 - 12:00 I/3 - Multi-Platform Multi-Sensor System Calibration 2**

Session Chair: Cheng Wang, Xiamen University

Session Co-Chair: Petri Niiles Rönholm, Aalto University

**10:30 Efficient orientation and calibration of large aerial blocks of multi-camera platforms**  
*Wilfried Karel, TU Wien, Austria*

**10:48 Quality analysis and correction of mobile backpack laser scanning data**  
*Petri Rönholm, Aalto University, Finland; Finnish Geospatial Research Institute, Finland*

**11:06 Low cost and efficient 3d indoor mapping using multiple consumer rgb-d cameras**  
*Shuang Song, Wuhan University, China*

**11:24 Geometric calibration of Ziyuan-3 three-line cameras combining ground control points and lines**

*Jinshan Cao, Collaborative Innovation Center of Geospatial Technology, China*

**11:42 A novel matching algorithm based on phase correlation using peak calculation**

*Fan Mo2, Information Engineering University, China*

**14/7 10:30 - 12:00 II/2 - Multiscale n-dimensional Spatial Data Representations, Data Structures and Algorithms 2**

Session Chair: Thomas H. Kolbe, Technical University of Munich

Session Co-Chair: Francesc Antón Castro, DTU

**10:30 A conceptual model for the representation of landforms using ontology design patterns**

*Eric Guilbert, Université Laval, Canada*

**10:48 Two-graph building interior representation for emergency response applications**

*Pawel Boguslawski, University of the West of England, United Kingdom*

**11:06 Voluminator 2.0 - speeding up the approximation of the volume of defective 3D building models**

*Maximilian Sindram, Technische Universität München, Germany*

**11:24 Automatic Construction of Road Network Hierarchy**

*Weiping Yang, Esri, USA*

**14/7 10:30 - 12:00 III/4 - 3D Scene Analysis 1**

Session Chair: Franz Rottensteiner, Leibniz Universität Hannover

Session Co-Chair: Gunho Sohn, York University

**10:30 Facade Interpretation using a Marked Point Process**

*Susanne Wenzel, University of Bonn, Germany*

**10:48 Superpixel cut for figure-ground image segmentation**



Michael Ying Yang, TU Dresden, Germany

## **11:06 Classification of informal settlements through the integration of 2D and 3D features extracted from UAV data**

Caroline Margaux Gevaert, University of Twente, The Netherlands

## **11:24 Object-based coregistration of terrestrial photogrammetric and ALS point clouds in forested areas**

Przemyslaw Polewski, Munich University of Applied Sciences, Germany; Technische Universitaet Muenchen, Germany

## **11:42 Fast Probabilistic Fusion of 3D Point clouds via Occupancy Grids for Scene Classification**

Andreas Kuhn, Bundeswehr University Munich, Germany

## **14/7 10:30 - 12:00 IV/4 - Geospatial Data Infrastructure 1**

**Session Chair:** E. Pattabhi Rama Rao, Indian National Centre for Ocean Information Services

**Session Co-Chair:** Dev Raj Paudyal, University of Southern Queensland

## **10:30 Critical Assessment of Object Segmentation in Aerial Image Using Geo-Hausdorff Distance**

Hui Sun, Wuhan University, China

## **10:48 The fundamental spatial data in the basic public administration registers**

Karel Janečka, University of West Bohemia, Czech Republic

## **11:06 Enhanced data discoverability for in situ hyperspectral datasets**

Barbara A. Rasaiah, UCAR, USA

## **11:24 The European Location Framework - from national to European**

Eva Pauknerova, Czech Office for Surveying, Mapping and Cadastre, Czech Republic

## **14/7 10:30 - 12:00 SAF - SA2 Remote sensing for environmental monitoring and societal benefit**

**Session Chair:** Ian Dowman, UCL

## **10:30 Societal Benefits and GEO's Second Decade**

Barbara Ryan, GEO Secretariat

## **10:52 Climate from Space**

Briggs Stephen, European Space Agency, Senior Adviser, Earth Observation, GCOS

## **11:14 Applications of Earth Observation for Societal Benefit: Case Studies in Africa**

Hussein Farah, RCMRD, Kenya

## **11:36 Relationship between climate change impact, migration and socioeconomic development**

Kyaw Sann Oo, Myanmar Peace Center, Myanmar

## **14/7 10:30 - 12:00 NMCAF - SN2 3-dimensional geoinformation**

**Session Chair:** André Streilein, Swiss Federal Office of Topography

## **10:30 Towards a 3D Spatial Data Infrastructure in the Netherlands**

Jantien Stoter, TU Delft, The Netherlands

## **10:52 New geospatial products of the Czech Republic**

Karel Brázdil, Land Survey Office, Czech Republic

## **11:14 An INSPIRE conform 3D Building Model of Bavaria using cadastre information, LIDAR and image matching**

Joachim Batscheider, Bavarian Agency for Digitisation, High-Speed Internet and Surveying, Germany

## **11:36 First Steps Towards an Integrated Citygml-Based 3D Model of Vienna**

Giorgio Agugiaro, AIT - Austrian Institute of Technology, Austria

## **14/7 10:30 - 12:00 SpS13 - FIG's contributions to the Geo-Spatial Society**

**Session Chair:** Gerda Schennach, FIG/OVG

**Session Co-Chair:** Sagi Dalyot, The Technion

## **10:30 The Contribution of Surveyors in the Sustainable Management of Cities and Rapidly Urbanized Areas**

Chryssy Potsiou, National Technical University of Athens, Greece

## **10:48 Bridging the Gap between Surveyors and the Geo-Spatial Society**

Hartmut Müller, Mainz University of Applied Sciences, Germany

## **11:06 Understanding urban regeneration in turkey**

Ezgi Candas, Istanbul Technical University, Turkey

## **14/7 10:30 - 12:00 V/2 - Cultural Heritage Data Acquisition and Processing: Image based survey for CH**

Session Chair: Thomas Robert Jordan, University of Georgia

Session Co-Chair: Dante Abate, The Cyprus Institute

## **10:30 360° Immersive images to virtualize indoor complex architectures. The study case of Gothic apse**

Araceli Pérez, University of A Coruña, Spain

## **10:48 Combining Public Domain and Professional Panoramic Imagery for the Accurate and Dense 3d Reconstruction of the Destroyed Bel Temple in Palmyra**

Wissam Wahbeh, University of Applied Sciences and Arts Northwestern Switzerland FHNW, Switzerland

## **11:06 Data Provenance in Photogrammetry through Documentation Protocols**

Nicola Carboni, UMR 3495 MAP CNRS/MCC, France

## **11:24 Using Remotely Sensed Data for Documentation of Archaeological Sites in Northeastern Mesopotamia**

Eva Matoušková, Czech Technical University in Prague, Czech Republic

## **14/7 10:30 - 12:00 VII/4 - Methods for Image Classification 4**

Session Chair: Julian Smit, University of Cape Town

Session Co-Chair: Brajesh Kumar, MJP Rohilkhand University

## **10:30 A data field method for urban remotely sensed imagery classification considering spatial correlation**

Ye Zhang, Wuhan University, China

## **10:48 A region-based multi-scale approach for object-based image analysis**

Taskin Kavzoglu, Gebze Technical University, Turkey

## **11:06 Aerial urban classification based on image pixel labelling with deep convolutional neural networks and logistical regression**

Wei Yao, Munich University of Applied Sciences, Germany

## **11:24 Topic modeling for object-based classification of VHR remote sensing images based on multiscale segmentations**

Li Shen, Southwest Jiaotong University, China

## **14/7 10:30 - 12:00 VIII/1 - Disaster and Risk Reduction 3**

Session Chair: Vijaya Sunanda Manneela, Indian National Centre for Ocean Information Services

Session Co-Chair: Peter Fischer, German Aerospace Center

## **10:30 Near real-time determination of earthquake source parameters for tsunami early warning from geodetic observations**

V. Sunanda Manneela, Indian National Centre for Ocean Information Services, India

## **10:48 Assessment of the utility of the Advanced Himawari Imager to detect and attribute fire over Australia**

Bryan Hally, RMIT University, Australia; Bushfire and Natural Hazards Co-operative Research Centre; University of Twente, The Netherlands

## **11:06 Landslides extraction from diverse remote sensing data sources using semantic reasoning**

Wen Cao, Tongji University, China

## **11:24 Refinement method for residential area revision in earthquake risk assessment based on remote sensing**

Aixia Dou, China Earthquake Administration, China

## **11:42 Automatic Building Damage Detection Method Using High-Resolution Remote Sensing Images and 3D GIS Model**

Jihui Tu, Wuhan University, China; Electronics & Information School of Yangtze University, China

## 14/7 10:30 - 12:00 VIII/2 - Health 1

**Session Chair:** Fazlay S. Faruque, University of Mississippi Medical Center Services

**Session Co-Chair:** Alexander Liss, Tufts University

**10:30** Role of remote sensing in population density estimates and utility in spatiotemporal schistosomiasis risk modeling in Ghana

Alexandra V. Kulinkina, Tufts University, USA

**10:48** Linking Satellite Remote Sensing Based Environmental Predictors to Disease: An Application to the Spatiotemporal Modelling of Schistosomiasis in Ghana  
Madeline Wrable, Tufts University, USA

**11:06** Spatial Correlations of Malaria Incidence Hotspots with Environmental Factors in Assam, North East India  
Bijoy Krishna Handique, North Eastern Space Applications Centre, India

**11:24** Stochastic coloured petrinet based healthcare infrastructure interdependency model  
Nivedita Nukavarapu, Indian Institute of Technology Bombay, India

**11:42** Schistosomiasis: geospatial surveillance and response systems in southeast Asia  
John Malone, Pathobiological Sciences, School of Veterinary Medicine, USA

## 14/7 13:30 - 15:00 I/5 - Satellite Systems for Earth Observation 1

**Session Chair:** Xinming Tang, the Satellite Surveying and Mapping Application Center, National Administration of Surveying, Mapping and Geo-information

**Session Co-Chair:** Ralf Reulke, Humboldt-Universität zu Berlin

**13:30** Current Status of International Airborne Platform Data and Instrument Interface Standards  
Matt Freer, Droplet Measurement Technologies, USA

**13:48** Automatic mrf-based registration of high resolution satellite video data  
Christos Platias, National Technical University

of Athens, Greece

**14:06** The new hyperspectral sensor DESIS on the multi-payload platform MUSES installed on ISS  
Rupert Mueller, DLR, Germany

**14:24** Pléiades project: assessment of georeferencing accuracy, image quality, pansharpening performance and DSM/DEM quality  
Hüseyin Topan, Bülent Ecevit University, Turkey

**14:42** Geospatial analysis using remote sensing images: case studies of Zonguldak test field  
Caglar Bayik, Bulent Ecevit University, Turkey

## 14/7 13:30 - 15:00 I/ThS 11 - Unmanned Aerial Systems: The Roadmap from Research to Applications 2

**Session Chair:** Görres Jochen Grenzdörffer, Rostock University

**Session Co-Chair:** Costas Armenakis, York University

**13:30** Potential of UAV-based laser scanner and multispectral camera data in building inspection  
David Mader, TU Dresden, Germany

**13:48** UAS based tree species identification using the novel FPI based hyperspectral cameras in visible, NIR and SWIR spectral ranges  
Roope Näsi, Finnish Geospatial Research Institute, Finland

**14:06** Compact hyperSpectral Imaging system (cosi) for small remotely piloted aircraft systems (RPAS) – system overview and first performance evaluation results  
Aleksandra Sima, Flemish Institute for Technological Research - VITO NV, Belgium

**14:24** UAV Monitoring for Environmental Management in Galapagos Islands  
Daniela Ballari, University of Cuenca, Ecuador

**14:42** Satellite Imagery Assisted Road-based Visual Navigation System  
Anastasiia Volkova, University of Sydney, Australia



**14/7 13:30 - 15:00 IV/7 - 3D Indoor Modeling and Navigation 1**

Session Chair: Sisi Zlatanova, Delft University of Technology

Session Co-Chair: George Sithole, University of Cape Town

**13:30 Localization corrections for mobile laser scanner using local support-based outlier filtering**

Ville V Lehtola, Aalto University, Finland

**13:48 Moving human path tracking based on video surveillance in 3D indoor scenarios**  
Zhe Wang, University of Electric Science and Technology of China, China

**14:06 First Experiments with the Tango Tablet for Indoor Scanning**

Abdoulaye Abou Diakité, TU Delft, The Netherlands

**14:24 Modeling of Indoor Space Using a Rotating Stereo Frame Camera System**  
Jeongin Kang, University of Seoul, Korea

**14:42 Geofencing-based localization for 3D data acquisition navigation**

Masafumi Nakagawa, Shibaura Institute of Technology, Japan

**14/7 13:30 - 15:00 SAF - SA3 New Earth Observation technologies and applications: The commercial perspective**

Session Chair: Stephen Briggs, ESA

**13:30 New Earth Observation technologies and applications: The commercial perspective**

Schingler Robbie, Planet Labs

**13:52 An Overview of UrtheCast's UrtheDailyTM and OptiSARTM Constellation**  
Larson Wade, UrtheCast

**14:14 Successful Launch & Commission of TripleSat Constellation - Start of Commercial Operation Services**

Sun Wei, 21Aerospace Technology, China

**14:36 EO Services in this Changing World**  
Andre Jadot, EARSC

**14/7 13:30 - 15:00 NMCAF - SN3 Geospatial data infrastructures**

Session Chair: Julius Ernst, OVG- Austrian Society for Surveying and Geoinformation

**13:30 Service-oriented National Geospatial Data Infrastructure of China**

Chunfeng Wang, National Administration of Surveying, Mapping and Geoinformation, China

**13:52 The Role of Geospatial Information for Sustainable Development, the African Perspective**

Sultan Mohammed Alya, Ethiopian Mapping Agency, Ethiopia

**14:14 Integrating a Global Policy Agenda into National Geospatial Capabilities**

Gregory Scott, UN-GGIM, USA

**14:36 Reinventing the national topographic database**

Risto Ilves, National Land Survey of Finland, Finland

**14/7 13:30 - 15:00 V/1 - Vision Metrology 1**

Session Chair: Mark Shortis, RMIT University

Session Co-Chair: Stuart Robson, UCL

**13:30 Industrial photogrammetry - accepted metrology tool or exotic niche**

Werner Bösemann, AICON 3D Systems GmbH, Germany

**14:06 Accuracy of 3D Reconstruction in an Illumination Dome**

Lindsay W. MacDonald, University College London, United Kingdom

**14:24 A method to achieve large volume, high accuracy photogrammetric measurements through the use of an actively deformable sensor mounting platform**

Ben Sargeant, University College London, United Kingdom

**14:42 A Holistic Approach for Inspection of Civil Infrastructures Based on Computer Vision Techniques**

Christos Stentoumis, National Technical University of Athens, Greece

**14/7 13:30 - 15:00 VI/2 - E-Delivery of Education Services**

Session Chair: Anjana Vyas, CEPT University

Session Co-Chair: Gerhard König,

Technische Universität Berlin

**13:30 An adaptive web-based learning environment for the application of remote sensing in schools**

Nils Wolf, Heidelberg University of Education, Germany

**13:48 Development of an all-purpose free photogrammetric tool**

Diego Gonzalez-Aguilera, University of Salamanca, Spain

**14:06 A Cognitive Approach to Teaching a Graduate Level Geobia Course**

Raechel Bianchetti, Michigan State University, USA

**14:24 Lost in the cloud - new challenges for teaching GIS**

Chris Bellman, RMIT University, Australia

**14:42 Learning Photogrammetry with Interactive Software Tool PhoX**

Thomas Luhmann, Jade University of Applied Sciences, Germany

**14/7 13:30 - 15:00 VII/6 - Remote Sensing Data Fusion 1**

Session Chair: Peter Reinartz, DLR

Session Co-Chair: Zhilin Li, Hong Kong Polytechnic University

**13:30 Graph matching for the registration of persistent scatterers to optical oblique imagery**

Lukas Schack, Leibniz Universität Hannover, Germany

**13:48 A new spatial and temporal fusion model**

Jing Wang, The Chinese University of Hong Kong, Hong

**14:06 On the challenges in stereogrammetric fusion of SAR and optical imagery for urban areas**

Michael Schmitt, Technical University of Munich, Germany

**14:24 Alternatives to four-component decomposition for polarimetric sar**

Jixian Zhang, Chinese Academy of Surveying & Mapping, China

**14:42 Mapping urban tree canopy cover**

**using fused airborne lidar and satellite imagery data**

Ebadat Ghanbari Parmehr, RMIT University, Australia

**14/7 13:30 - 15:00 VIII/1 - Disaster and Risk Reduction 4**

Session Chair: Przemyslaw Tymkow, Wrocław University of Environmental and Life Sciences

Session Co-Chair: Junhee Youn, Korea Institute of Civil Engineering and Building Technology

**13:30 3D GIS for flood modelling in river valleys**

Przemyslaw Tymkow, Wrocław University of Environmental and Life Sciences, Poland

**13:48 Integrating geo-spatial data for regional landslide susceptibility modeling in consideration of run-out signature**

Jhe-Syuan Lai, National Central University, Taiwan

**14:06 Landslides Identification Using Topographic Terrain Attributes Derived from Airborne Laser Scanning Data and SVM Classification**

Kamila Pawłuszek, Wrocław University of Environmental and Life Sciences, Poland

**14:24 Least Square Support Vector Machine for Detection of Tec-Seismo-Ionospheric Anomalies Associated with the Powerful Nepal Earthquake (Mw=7.5) of 25 April 2015**

Mehdi Akhoondzadeh Hanzaei, University of Tehran, Iran

**14:42 Estimation of Damaged Areas due to the 2010 Chile Earthquake and Tsunami Using SAR Imagery of ALOS/PALSAR**

Pertiwi Jaya Ni Made, Yamaguchi University, Japan

**14/7 13:30 - 15:00 VIII/2 - Health 2**

Session Chair: Fazlay S. Faruque, University of Mississippi Medical Center

Session Co-Chair: Yves M. Tourre, Ldeo of Columbia University

**13:30 Re-emerging Malaria vectors in rural Sahel (Nouna, Burkina Faso): The Paluclim project**

Yves M. Tourre, Ldeo of Columbia University, USA

**13:48** Extending LKN climate regionalization with spatial regularization: An application to epidemiological research

Alexander Liss, Tufts University, USA

**14:06** Spatial distrubiton of children treated by cancer in Zonguldak, Turkey

Mustafa Özendi, Bülent Ecevit University, Turkey

**14:24** Influence of Topographic and Hydrographic Factors on the Spatial Distribution of Leptospirosis Disease in Sao Paulo, Brazil: an Approach Using Geospatial Techniques and GIS Analysis

Marcos César Ferreira, UNICAMP - State University of Campinas, Brazil

**14:42** Geographic Medical History: Advances in Geospatial Technology Present New Potentials in Medical Practice

Fazlay S. Faruque, University of Mississippi Medical Center, USA

**14/7 15:00 - 16:30** Interactive session

(I/5, II/2, III/5, IV/8, V/1, V/2, VI/2, VIII/1, VIII/2, ThS11, ThS17, SpS13, SpS14)

**I/5 - Satellite Systems for Earth Observation**

**High Performance Computing for DSM Extraction from ZY-3 Tri-stereo Imagery**  
Yubin Xin, PCI Geomatics, Canada

**Automatic assessment of acquisition and transmission losses in Indian remote sensing satellite data**

Deepika Roy, Indian Space Research Organization, India

**Evaluation the Potential of Satellite Hyperspectral Resurs-P2 Data for Forest Application**

Olga Brovkina, Global Change Research Centre, Czech Republic

**Assessment of satellite precipitation products in the Philippine archipelago**

Mark Daryl Ramos, University of the Philippines; IBM Philippines

**On The Evaluation of GNSS**

**Complementary by Using Quasizenith Satellite of Japan**

Masaaki Shikada, Kanazawa Institute of Tecnology, Japan

**Georeferencing accuracy analysis of a single WorldView-3 image collected over Milan**

Luigi Barazzetti, Politecnico di Milano, Italy

**Assessment of the geometric quality of Sentinel-2 data**

Miloš Pandžić, University of Belgrade, Serbia

**GPS AND GLONASS combined static precise point positioning**

Onkar Dikshit, Indian Institute of Technology (IIT) Kanpur, India

**Analysing post-seismic deformation of izmit earthquake with insar, gnss and coulomb stress modelling**

Ruken Alac Barut, University of New South Wales, Australia

**Multi-Satellite Scheduling Approach for Dynamic Areal Tasks Triggered by Emergent Disasters**

Xiaonan Niu, Beijing Normal University, China

**Tutorial 6: Practical Remote Sensing: Handling Optical Data, Elbegjargal Nasanbat**

Elbegjargal Nasanbat, National Remote Sensing Center

**Philippines' first earth observation micro satellite: standard products**

Gay Jane Perez, University of the Philippines Diliman, Philippines

**II/2 - Multiscale n-dimensional Spatial Data Representations, Data Structures and Algorithms**

**The need of nested grids for aerial and satellite images and Digital Elevation Models**

Guillermo Villa, National Geographic Institute. Spain

**Establishing a national 3d geo-data model for building data compliant to CityGML: case of Turkey**

Serpil Ates Aydar, Istanbul Technical



University, Turkey

## **Cloud removal from multi-temporal satellite images using cloud substitution model**

*Danang Surya Candra, University of Queensland, Australia*

## **Technical aspects for the creation of a multi-dimensional Land Information System**

*Charalabos Ioannidis, National Technical University of Athens*

## **3D Nearest Neighbor Search Using a Clustered Hierarchical Tree Structure**

*Francesc Antón Castro, Technical University of Denmark*

## **3D geo-information requirements for disaster and emergency management**

*Elif Demir Özbek, Istanbul Technical University, Turkey*

## **III/5 - Computer Graphics and Remote Sensing**

### **Irregular Morphing for Real-Time Rendering of Large Terrain**

*Sid Ali Kalem, USTHB, Algeria*

### **New Approach for forest inventory estimation and timber harvesting planning in mountain areas: the SLOPE project**

*Federico Devigili, Fondazione Graphitech, Italy*

### **Evaluation of Colour Settings in Aerial Images with the Use of Eye-Tracking User Study**

*Jakub Miřijovský, Palacký University in Olomouc, Czech Republic*

### **A Fast Approach for Stitching of Aerial Images**

*Adel Moussa, Univeristy of Calgary, Canada*

### **Special texture image matching based on graph theory**

*Shiyu Chen, Wuhan University, China*

### **Optical remote sensing image optimized dehazing algorithm based on HOT**

*Yang Zhou, Zhengzhou Institute of Surveying and Mapping, China*

### **Line feature matching**

*Jingxue Wang, Liaoning Technical University, R.P.China*

## **Denoising algorithm for the pixel-response non-uniformity correction of a scientific cmos under low light conditions**

*Changmiao Hu, Chinese Academy of Sciences, China*

## **IV/8 - Planetary Mapping and Spatial Databases**

### **Special software for planetary image processing and research**

*A.E. Zubarev, Moscow state university of geodesy and cartography, Russian Federation*

### **SPICE tools supporting planetary remote sensing**

*Charles Acton, NASA/JPL, USA*

### **Mapping of panetary surface age based on crater statistics obtained by an automatic detection algorithm**

*Atheer L. Salih, TU Dortmund, Germany*

### **Quantitative assessment of a novel super-resolution restoration technique using HiRISE with MSL Navcam images: how much resolution enhancement is possible from repeat-pass observations**

*Yu Tao, University College London, United Kingdom*

### **Radiometric calibration of Mars HiRISE high resolution imagery based on FPGA**

*Yifan Hou, Information Engineering University, China; Information Engineering University, China*

### **Geometric calibration of the Clementine UVVIS Camera using images acquired by the Lunar Reconnaissance Orbiter**

*Emerson Jacob Speyerer, Arizona State University, USA*

### **Batch co-registration of Mars high-resolution images to HRSC MC11-E mosaic**

*Panagiotis Sidiropoulos, Mullard Space Science Laboratory, United Kingdom*

### **Development of heterogenic distributed environment for spatial data processing**

**using cloud technologies**

*I. P. Karachevtseva, Moscow state university of geodesy and cartography, Russian Federation*

**Automation of Morphometric Measurements for Planetary Surface Analysis and Cartography**

*A. A. Kokhanov, Moscow state university of geodesy and cartography, Russian Federation*

**Libration Model for Enceladus Based on Geodetic Control Point Network**

*E.S. Brusnikin, Moscow state university of geodesy and cartography, Russian Federation*

**Dense image matching of Mars Express HRSC imagery based on precise point prediction method**

*Yifan Hou, Information Engineering University, China*

**Mapping of inner and outer celestial bodies using new global and local topographic data derived from photogrammetric image processing**

*A. Yu. Zharkova, Moscow state university of geodesy and cartography, Russian Federation*

**V/1 - Vision Metrology**

**Eccentricity on an image caused by projection of a circle and a sphere**

*Ryuji Matsuoka, Kokusai Kogyo Co., Ltd., Japan*

**Determination of steering wheel angles during car alignment by image analysis methods**

*Thomas Voegtle, Karlsruhe Institute of Technology (KIT), Germany*

**Performance evaluation of 3D modeling software for UAV photogrammetry**

*Hideharu Yanagi, Japan Association of Survivors, Japan*

**Application of vision metrology to in-orbit measurement of large reflector onboard communication satellite for next generation mobile satellite communication**

*Maki Akioka, National Institute of Information and Communications Technology, Japan*

**On fundamental evaluation using uav imagery and 3d modeling software**

*Kazuya Nakano, Aero Asahi Corporation, Japan; Tokyo Denki University, Japan*

**Robust vision-based pose estimation algorithm for an UAV with known gravity vector**

*Vladimir Kniaz, State Research Institute of Aviation Systems (GosNIIAS), Russian Federation*

**V/2 - Cultural Heritage Data Acquisition and Processing**

**From point cloud to digital fabrication: a tangible reconstruction of Ca' Vendramin dei Leoni, the Guggenheim Museum in Venice**

*Caterina Balletti, università luav di venezia, Italy*

**Knowledge and valorization of historical sites through 3D documentation and modeling**

*Elisa Farella, Federico II University, Italy*

**Use of Image Based Modelling for Documentation of Intricately Shaped Objects**

*Peter Barták, S s.r.o., Páříčková 18, 82108 Bratislava, Slovakia*

**Photogrammetric Techniques for Promotion of Archaeological Heritage: The Archaeological Museum of Parma (Italy)**

*Elisa Dall'Asta, University of Parma, Italy*

**The representation of cultural heritage from traditional drawing to 3D survey: the case study of casamary's abbey**

*Marco Canciani, University of RomaTre, Italy*

**The Process of Digitizing of Old Globe**

*Klara Ambrozova, VUGTK, v.v.i., Czech Republic*

**HGIS and archive researches: a tool for the study of the ancient mill channel of Cesena (Italy)**

*Gabriele Bitelli, University of Bologna, Italy*

**Computational Vision in UV-Mapping of Textured Meshes Coming from Photogrammetric Recovery: Unwrapping Frescoed Vaults**

*Isabel Martínez-Espejo Zaragoza, Pisa University, Italy*

**Integration of point clouds from tIs and image-based matching for generation of high resolution orthoimages**

*Adam Salach, Warsaw University of Technology, Poland*

**3D Modelling and Interactive Web-Based Visualization of Cultural Heritage Objects**

*Mila Nikolaeva Koeva, University of Twente, Netherlands*

**Applications of macro photogrammetry in archaeology**

*Dubravko Gajski, Faculty for Geodesy, Croatia*

**From point cloud to BIM: a modelling challenge in the cultural heritage field**

*Cinzia Tommasi, Politecnico di Milano, Italy*

**Data Integration Acquired from Micro-UAVs and Terrestrial Laser Scanner for the 3D Mapping of Jesuit Ruins of São Miguel Das Missões**

*Mário Luiz Lopes Reiss, Federal University of Rio Grande do Sul, Brazil*

**Non-destructive survey of archaeological sites using airborne laser scanning and geophysical applications**

*Zdeněk Poloprutský, CTU in Prague, Czech Republic*

**Three-Dimensional Recording of Bastion Middleburg Monument Using Terrestrial Laser Scanner**

*Zulkepli Bin Majid, Universiti Teknologi Malaysia, Malaysia*

**TLS Models generation assisted by UAV survey**

*Antonia Spanò, Politecnico di Torino, Italy*

**Acquisition of 3D Information for Vanished Structure by Using Only an Ancient Picture**

*Yoichi KUNII, Tokyo University of Agriculture, Japan*

**A geodatabase for multisource data**

**applied to cultural heritage: the case study of Villa Revedin Bolasco**

*Alberto Guarnieri, University of Padova, Italy*

**Probabilistic Guidance of the Reconstruction Process of Russian-orthodox Churches**

*Maria Chizhova, University of Applied Sciences Würzburg-Schweinfurt, Germany; Technische Universität München, Germany*

**3D Documentation and Data Management in the Dazu Thousand-Hand Bodhisttava Statue in China**

*Miaole Hou, Beijing University of Civil Engineering and Architecture, China*

**3D Modeling of Components of a Garden by Using Point Cloud Data**

*Rihito Kumazaki, Tokyo University of Agriculture, Japan*

**Digitization of cultural heritage of Slovak Republik**

*Anna Sučíková, Pamiatkový úrad SR, Slovakia*

**Applying lidar data in modern age archaeology and military historical reconstruction**

*Attila Juhász, Budapest University of Technology and Economics, Hungary*

**The Survey of Cultural Heritage after an Earthquake: The Case of Emilia – Lombardia In 2012**

*Andrea Adami, Politecnico di Milano, Italy*

**VI/2 - E-Delivery of Education Services**

**GUIDE - A web-based information system promoting learning software in photogrammetry, remote sensing and GIS**  
*Gerhard König, Technische Universität Berlin, Germany*

**E-Learning in Photogrammetry, Remote Sensing and Spatial Information Science**  
*Anjana Vyas, CEPT University, India*

**VIII/1 - Disaster and Risk Reduction**

**Disaster Management: An Integral Part of Science & Technology System and Land Administration-Management System**



*Sisi Zlatanova, Delft University of Technology,  
The Netherlands*

**Extraction of flooded areas due the 2015  
Kanto-Tohoku heavy rainfall in Japan  
using PALSAR-2 images**

*Fumio Yamazaki, Chiba University, Japan*

**Sentinel-1/2 data for ship traffic  
monitoring on the Danube River**

*Alexandru Badea, Romanian Space Agency,  
Romania*

**A UAV based 3D positioning framework  
for detecting locations of buried persons  
in collapsed disaster area**

*Hyoungseok Moon, Korea Institute of Civil  
Engineering and Building Technology, Korea*

**Evaluating the Human Damage of  
Tsunami at Each Time Frame in Aggregate  
Units Based on GPS data**

*Yoshiki Ogawa, The University of Tokyo,  
Japan*

**Radioactive pollution estimate for  
Fukushima Nuclear Power Plant by a  
particle model**

*Keisuke Saito, Nagasaki University, Japan*

**An attempt to develop an Environmental  
Information System of Ecological  
Infrastructure for evaluating functions of  
Ecosystem-based Solutions for Disaster  
Risk Reduction (Eco-DRR)**

*Tomoko Doko, Keio University, Japan; Nature  
& Science Consulting Co., Ltd., Japan*

**Environmental Impact Assessment  
of Rosia Jiu Opencast Area Using an  
Integrated SAR Analysis**

*Alexandru Badea, Romanian Space Agency,  
Romania*

**Spatial Resolution Effects of Digital  
Terrain Models on Landslide Susceptibility  
Analysis**

*Kuan-Tsung Chang, Ming-hsin University of  
Science and Technology, Taiwan*

**Running to safety: analysis of disaster  
susceptibility of neighborhoods and  
proximity of safety facilities in Silay City,  
Philippines**

*Chito Lim Patiño, University of the Philippines  
Cebu Phil-LiDAR 1, Philippines*

**Analysis of debris flow behaviors using**

## **airborne LiDAR and image data**

*Gihong Kim, Gangneung-Wonju National University, Korea*

## **Detecting Disaster Damages of 2015 Typhoon Etau by the Combination Use of Different SAR Satellites**

*Kenichi Honda, Kokusai Kogyo Co.,Ltd., Japan*

## **Landslide risk mapping and modeling in China**

*Weiyue Li, Shanghai Normal University, China*

## **The Study of Insurance Premium Rate Mapping Considering the Wind and Flood Hazard Risks**

*JunSeok Lee, LX Spatial Information Research Institute, Korea*

## **Vulnerability Assessment Using LiDAR Data in Silang-Sta. Rosa Subwatershed, Philippines**

*Milben Alejandro Bragais, University of the Philippines Los Baños, Philippines*

## **Analysis of debris flow disaster due to heavy rain by X-band MP radar data**

*Masahiro Nishio, Kinki University, Japan*

## **VIII/2 – Health**

### **Spatial-temporal modelling of particulate matter for health effects studies**

*Nicholas A. S. Hamm, University of Twente, Netherlands*

### **Causative factors of social inequality and its impact on community health: A Neighbourhood level study in Midnapore Municipal Area, West Bengal, India**

*Utpal Roy, University of Calcutta, India*

## **ThS 11 - Unmanned Aerial Systems: The Roadmap from Research to Applications**

### **A workflow for UAVs integration into a geodesign platform**

*Andreea Calugaru, ESRI Romania, Romania; University of Agronomic Sciences and Veterinary Medicine Bucharest*

### **Accuracy assessment of coastal topography reived from UAV images**

*Nathalie Long, LIENSS, Université de La Rochelle – CNRS, France*

## **Multi-criteria gis analyses with the use of uavs for the needs of spatial planning**

*Dorota Zawieska, Warsaw University of Technology, Poland*

## **ThS 17 - Smart cities**

### **Estimation of housing vacancy distributions: basic Bayesian approach using utility data**

*Kiichiro Kumagai, Setsunan University, Japan*

### **Mobile gis: A tool for informal settlement occupancy audit to improve integrated human settlement implementation in Ekurhuleni, South Africa**

*Baleseng Mokoena, University of Johannesburg, South Africa*

### **Road Network Extraction from DSM by Mathematical Morphology and Reasoning**

*Yan Li, Nanjing University, China*

### **Estimating pm2.5 in jjj region using 3km modis aod product and meteorological data**

*Yuenan Li, University of Waterloo, Canada*

### **Geomatics for smart cities: obtaining the urban planning BAF index from existing digital maps**

*Vittorio Casella, University of Pavia, Italy*

### **Investigating the influence of vegetation density and road network on crime - a case study in Vancouver, British Columbia, Canada**

*Yuenan Li, University of Waterloo, Canada*

### **Visualisation of dependencies between city structure and thermal behaviour in Brno**

*Jan Novotny, Academy of Sciences of the Czech Republic, v. v. i., Czech Republic*

## **SpS 13 - FIG: The Surveyors' Response to City Management**

### **Study of using MMS to determine risk of road blocking by collapsed buildings**

*Kazuhito Nose, ASIA AIR SURBEY CO., LTD., Japan*

## **SpS 14 - IAG: Imaging Geodesy**

### **Geodetic reference system**

**transformations of 3D archival geospatial data using a single SSC TerraSAR-X image**

*Dimitra Vassilaki, Technological Educational Institute of Athens, Greece*

**Rescheduled interactive presentations**

**Analysis of the possibilities of using low-cost scanning system in 3d modeling**

*Michal Maksymilian Kedzierski, Military University of Technology, Poland*

**Chosen aspects of satellite imagery integration from EROS B and LANDSAT 8**

*Paulina Delis, Military University of Technology, Poland*

**Determining spectral reflectance coefficients from hyperspectral images obtained from low altitudes**

*Agnieszka Jenerowicz, Military University of Technology, Poland*

**Integration of Geodata in Documenting Castle Ruins**

*Paulina Nerc, Military University of Technology in Warsaw, Poland*

**14/7 15:30 - 17:00 SAF - SA4 Earth Observation Data Policy and long-term Data Continuity**

Session Chair: Lawrence FRIEDL, NASA

**15:30 The Contribution of Earth Observation Time Series to the Global Change Dialogue**  
Ehrenfreund Pascale, DLR

**15:52 Geospatial data in support of Future Earth**

Mario Hernandez, Future Earth, Switzerland

**16:14 Space Data for Societal challenges and Growth; Access to Copernicus data for society and the economy**

Andreas Veispak, European Commission, DG GROW I3

**16:36 Standards-Based Services for Big Spatio-Temporal Data**

Peter Baumann, Jacobs University, Germany

**14/7 15:30 - 17:00 NMCAF - SN4 Quality assessment of geoinformation**

Session Chair: Andy Mc Gill, Ordnance Survey Ireland

**15:30 Quality Assessment in a Changing World**

Jonathan Holmes, EuroGeographics Quality Knowledge Exchange Network

**15:52 The topographic data deluge – collecting and maintaining data in a 21st century mapping agency**

David Anthony Holland, Ordnance Survey, United Kingdom

**16:14 Quality issues of 3D geometry in the Swiss Topographic Landscape Model**

Kellenberger Tobias, Swiss Federal Office of Topography swisstopo, Switzerland

**16:36 UNGGIM-ISPRS Project. Global Status of Mapping**

Gottfried Konecny, Leibniz University Hannover, Germany

**14/7 16:30 - 18:00 I/2 - LiDAR, SAR and Optical Sensors for Airborne and Spaceborne Platforms 2**

Session Chair: Dorota A. Grejner-Brzezinska, The Ohio State University

Session Co-Chair: Martin Kada, Technische Universität Berlin

**16:30 Quality Assessment of Building Textures Extracted from Oblique Airborne Thermal Imagery**

Dorota Iwaszczuk, Technische Universität München, Germany

**16:48 Improve the ZY-3 height accuracy using ICESat/GLAS laser altimeter data**  
Guoyuan Li, Wuhan University, China; Satellite Surveying and Mapping Application Centre, NASG, China; Jiangsu Center for Collaborative Innovation in Geographical Information Resource Development and Application, China

**17:06 Reduction of striping noise in overlapping LiDAR intensity data by radiometric normalization**

Wai Yeung Yan, Ryerson University, Canada



**17:24 Evaluation Digital Elevation Model Generated by Synthetic Aperture Radar Data**  
Hasan Bilgehan Makineci, Selcuk University, Turkey

**14/7 16:30 - 18:00 II/ThS 17 - Smart Cities 2**

**Session Chair:** Christopher James Pettit, UNSW Australia

**Session Co-Chair:** Arzu Coltekin, University of Zurich

**16:30 Real-time environmental sensors to improve health in the Sensing City**  
Lukas Marek, University of Canterbury, New Zealand

**16:48 Assessing urban droughts in a smart city framework**  
Renee Obringer, Purdue University, USA

**17:06 Big Cycling Data Processing: from Personal Data to Urban Applications**  
Christopher James Pettit, UNSW Australia, Australia

**17:24 Urban growth scenarios of a future mega city: case study Ahmedabad**  
Arthur Lehner, Austrian Institute of Technology, Austria

**17:42 Walkability for different urban granularities**  
Daria Hollenstein, FHNW University of Applied Sciences and Arts Northwestern Switzerland, Switzerland

**14/7 16:30 - 18:00 III/5 - Computer Graphics and Remote Sensing**

**Session Chair:** Mathieu Brédif, IGN

**Session Co-Chair:** Martin Christen, FHNW

**16:30 OpenWebGlobe 2: Visualization of Complex 3D-Geodata in the (mobile) Webbrowser**  
Martin Christen, FHNW, Switzerland

**16:48 Automatic mosaicking of satellite imagery considering the clouds**  
Yifei Kang, Wuhan University, China

**17:06 An IHS-Based Enhancement Method with Improved Scale/Shift Parameter of Linear Model**

Zhang Bingxian, Beijing Institute of Space Mechanics & Electricity, China

**17:24 Consistent tonal correction for multi-view remote sensing images mosaicking**  
Menghan Xia, Wuhan University, China

**17:42 Roof reconstruction from airborne laser scanning data based on image processing methods**  
Steffen Goebels, Niederrhein University of Applied Sciences, Germany

**14/7 16:30 - 18:00 IV/8 - Planetary Mapping and Spatial Databases 1**

**Session Chair:** Juergen Oberst, German Aerospace Center (DLR)

**Session Co-Chair:** Irina P. Karachevtseva, Moscow State University of Geodesy and Cartography

**16:30 Extracting Accurate and Precise Topography from LROC Narrow Angle Camera Stereo Observations**  
Megan Rachel Henriksen, Arizona State University, USA.

**16:48 A Solution to Low RFM Fitting Precision of Planetary Orbiter Images Caused by Exposure Time Changing**  
Bin Liu, Chinese Academy of Sciences, China

**17:06 Mass movements' detection in HiRISE images of the north pole of Mars**  
Lida Fanara, DLR, Germany; TU Berlin, Germany

**17:24 Identifying Surface Changes on HRSC Images of The Mars South Polar Residual Cap (SPRC)**  
Alfiah Rizky Diana Putri, University College London, United Kingdom

**17:42 A semi-rigorous sensor model for precision geometric processing of Mini-RF bistatic radar images of the Moon**  
Randolph Kirk, U.S. Geological Survey, Astrogeology Science Center, USA

**14/7 16:30 - 18:00 V/4 - Terrestrial 3D Modelling: Algorithms and Methods 1**

**Session Chair:** Jan Boehm, UCL

**Session Co-Chair:** Thomas Kersten, HafenCity University Hamburg

**16:30** Historical buildings models and their handling via 3D survey: from points clouds to HBIM

Giulia Sammartano, Politecnico di Torino, DAD, Italy

**16:48** 3D documentation of 40 kilometers of historical porticoes – The challenge

Fabio Remondino, FBK Trento, Italy

**17:06** 3D digitization of an heritage masterpiece - a critical analysis on quality assessment

Fabio Menna, 3D Optical Metrology (3DOM) unit, Bruno Kessler Foundation (FBK), Italy

**17:24** Evaluation of acquisition strategies for image-based construction site monitoring

Sebastian Tuttas, Technical University of Munich, Germany

**17:42** Sharing high-resolution models and information on web: the web module of bim3dsg system

Fabrizio Rechichi, Politecnico di Milano, Italy

**14/7 16:30 - 18:00 VII/6 - Remote Sensing Data Fusion 2**

**Session Chair:** Guoqing Zhou, Guilin University of Technology

**Session Co-Chair:** Michael Schmitt, Technical University of Munich (TUM)

**16:30** Super Resolution Reconstruction Based on Multi-scale Detail Enhancement of ZY-3 Satellite Images

Hong Zhu, Liaoning Technical University

**16:48** Modelling the Carbon Stocks Estimation of the Tropical Lowland Dipterocarp Forest Using LiDAR and Remotely Sensed Data

Nurul Ain Mohd Zaki, Universiti Teknologi Mara, Malaysia

**17:06** The Optimized Block-regression-based Fusion Algorithm for Pan-sharpening of Very High Resolution Satellite Imagery

Jinghui Yang, Chinese Academy of Surveying and Mapping, China; German Aerospace Center (DLR), Germany

**17:24** Assessment of cropping systems diversity in the Fergana Valley through image fusion of Landsat 8 and Sentinel-1

Dimo Dimov, University of Würzburg, Germany

**17:42** Pan-sharpening approaches based on unmixing of multispectral remote sensing imagery

Gintautas Palubinskas, German Aerospace Center DLR, Germany

**14/7 16:30 - 18:00 VIII/1 - Disaster and Risk Reduction 5**

**Session Chair:** Eugene Levin, Michigan Technological University

**Session Co-Chair:** Ramji Dwivedi, MNNIT Allahabad

**16:30** A New Method to Detect Regions Endangered by High Wind Speeds

Thomas Krauß, German Aerospace Center, Germany

**16:48** Multi-temporal SAR Interferometry for landslide monitoring

Ramji Dwivedi, Motilal Nehru National Institute of Technology (MNNIT) Allahabad, India

**17:06** Innovative airborne sensors for disaster Management

Orhan Altan, ISPRS 1st Vice President, Turkey

**17:24** A meteorological risk assessment method for power lines based on GIS and multi-sensor integration

Zhimin Xu, Wuhan University, China

**17:42** Drought forecasting based on machine learning of remote sensing and long-range forecast data

Sumin Park, UNIST, Korea, China; Satellite Surveying and Mapping Application Center, National Administration of Surveying, Mapping and Geo-information, China  
Kong S.A.R. (China)





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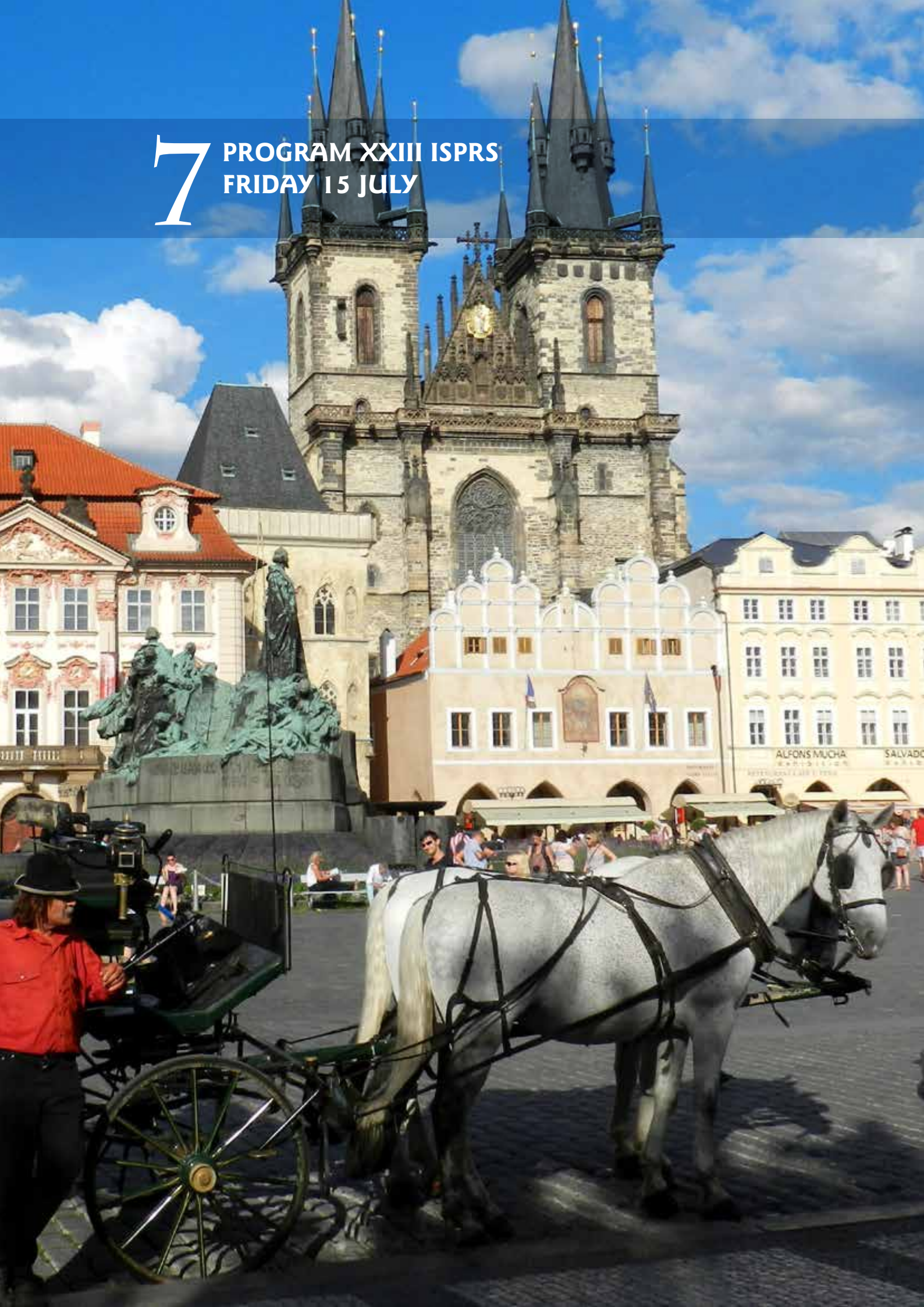
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# 7 PROGRAM XXIII ISPRS FRIDAY 15 JULY



Friday, 15 July, 2016

TIME	LOCATION	SESSION
08:30 - 10:00	Meeting Hall IV	Elsevier Session I
	Small HallII	I/Vb - Unmanned Vehicle Systems (UVS): Sensors and Applications 3
	Club H	II/3 - Spatial Analysis and Data Mining 1
	Club A	III/VII - Pattern Analysis in Remote Sensing
	Club B	IV/5 - Web and Cloud Based Geospatial Services and Applications 1
	Club C	IV/7 - 3D Indoor Modelling and Navigation 2
	Meeting Hall I	NMCAF+SAF - JS1 High-resolution satellite imaging for geospatial information
	Club E	V/5 - Close-range Measurements for Biomedical Sciences and Geosciences 2
	Club D	VII/ThS 15 - The quest for objects – does Geographic Object-based Image Analysis meet society's needs?
10:30 - 12:00	Meeting Hall IV	Elsevier Session II
	Club H	I/4 - Geometric and Radiometric Modeling of Optical Airborne and Spaceborne Sensors 1
	Small HallII	I/Vb - Unmanned Vehicle Systems (UVS): Sensors and Applications
	Club B	II/5 - GeoComputation and GeoSimulation
	Club A	III/1 - Orientation and Surface Reconstruction 2
	Meeting Hall I	NMCAF+SAF - JS2 Challenges
	Club C	V/1 - Vision Metrology 2
	Club D	VI/3 - Promotion of International Collaborative Education Programs + VI/5 - Promotion of the Profession to Young People
	Club E	VII/3 - Information Extraction from Hyperspectral Data 1: Spectral based information for Thematic Mapping
13:30 - 15:00	Meeting Hall V	VIII/3 - Weather, Atmosphere and Climate Studies
	Small HallII	I/Vb - Unmanned Vehicle Systems (UVS): Sensors and Applications 5
	Club B	II/6 - Geovisualization and Virtual Reality 1

	Club A	III/cloud - 3D Semantic Point Cloud Challenge
	Club C	IV/1 - Methods for the Update and Verification of Geospatial Databases 2
	Club D	IV/4 - Geospatial Data Infrastructure 2
	Meeting Hall I	NMCAF+SAF - JS3 Future prospects
	Meeting Hall IV	V/2 - Cultural Heritage Data Acquisition and Processing: Direct point cloud acquisition methods
	Meeting Hall V	VII/4 - Methods for Image Classification 5
	Club E	VIII/4 - Water Resources 1
15:00 - 16:30	Foyer 3rd Floor	Interactive session (II/6, III/4, III/VII, IV/1, IV/4, IV/7, V/5, VI/3, VI/4, VI/5, VIII/3, VIII/4,
16:30 - 18:00	Club H	I/2 - LiDAR, SAR and Optical Sensors for Airborne and Spaceborne Platforms 3
	Club B	II/6 - Geovisualization and Virtual Reality 2
	Club A	III/4 - 3D Scene Analysis 2
	Club C	IV/3 - Global DEM Interoperability 2
	Meeting Hall IV	V/5 - Close-range Measurements for Biomedical Sciences and Geosciences 3
	Club D	VII/SpS 16 - EARSeL: Imaging Spectroscopy in environmental analyses
	Meeting Hall V	VIII/4 - Water Resources 2
	Club E	VIII/5 - Energy & Geological Applications
	Meeting Hall I	White Elephant Session



## Friday 15 July 2016

### 15/7 08:30 - 10:00 Elsevier Session I

**08:30** Author/Reviewer workshop: 'How to publish (and review) in a top journal/ the ISPRS Journal of Photogrammetry and Remote Sensing

### 15/7 08:30 - 10:00 I/Vb - Unmanned Vehicle Systems (UVS): Sensors and Applications 3

Session Chair: Görres Jochen Grenzdörffer, Rostock University

Session Co-Chair: Francesco Nex, University of Twente - ITC Faculty

**08:30** Co-registration of dsms generated by uav and laser scanning systems  
Costas Armenakis, York University, Canada

**08:48** Assessment of the quality of digital terrain model produced from unmanned aerial system imagery  
Dejan Grigillo, University of Ljubljana, Slovenia

**09:06** A Robust Registration Algorithm For Time Series UAV-Image-Based Point Clouds For Change Detection  
Abdulla Al-Rawabdeh, University of Calgary, Canada

**09:24** Direct georeferencing of UAV data based on simple building structures  
Winhard Ronald Tampubolon, Universität der Bundeswehr München, Germany

### 15/7 08:30 - 10:00 II/3 - Spatial Analysis and Data Mining 1

Session Chair: Emmanuel Stefanakis, University of New Brunswick

Session Co-Chair: Qingming Zhan, Wuhan University

**08:30** Understanding urban traffic flow characteristics from the perspective of network centrality at different granularities  
Pengxiang Zhao, Wuhan University, China

**08:48** Event Detection Using Mobile Phone Mass GPS Data and Their Reliability Verification by DMSP/OLS Night Light Image  
Akiyama Yuki, The University of Tokyo, Japan

**09:06** Identification of Local Surface Urban Heat Island through the Morphology of the Land Surface Temperature  
Jiong Wang, Wuhan University, China

**09:24** A reliability evaluation system of association rules  
Jiangping Chen, Wuhan University, China

**09:42** Investigating the potential of activity tracking app data to estimate cycle flows in urban areas  
James Haworth, University College London, United Kingdom

### 15/7 08:30 - 10:00 III/VII - Pattern Analysis in Remote Sensing

Session Chair: Uwe Stilla, Technische Universität München

Session Co-Chair: Stefan Hinz, KIT Karlsruhe

**08:30** Semantic segmentation of aerial images with an ensemble of fully convolutional neural networks  
Dimitrios Marmanis, German Aerospace Center DLR, Germany; Technische Universität München, Germany

**08:48** Fusion of hyperspectral and VHR multispectral image classifications in urban areas  
Clément Mallet, IGN, France

**09:06** Palm tree detection using circular autocorrelation of polar shape matrix  
Abhishek Manandhar, Technische Universität München, Germany

**09:24** Vehicle detection of aerial image using TV-L1 texture decomposition  
Yanli Wang, Wuhan University, China

### 15/7 08:30 - 10:00 IV/5 - Web and Cloud Based Geospatial Services and Applications 1

Session Chair: Bert Veenendaal, Curtin University

Session Co-Chair: Lixin Wu, China University of Mining & Technology

**08:30** The new NASA Web World Wind virtual globe and visualization of VGI data  
Candan Eylul Kilislar, Politecnico di Milano, Italy

**08:48** The URBIS project: Identification and characterization of potential urban development areas as a web-based service  
Nina Mancke, Universität Osnabrück, Germany

**09:06** A map mash-up application: investigation the temporal effects of climate change on salt lake basin  
Osman Sami Kirtiloglu, Selcuk University, Konya, Turkey

**09:24** A Wildlife Monitoring System Based on Tianditu and Beidou: In Case of the Tibetan Antelope  
Hongping Zhang, National Geomatics Center of China, China

**09:42** Publishing platform for aerial orthophotos, the complete stack  
Jachym Cepicky, Cleerio s.r.o., Czech Republic

## 15/7 08:30 - 10:00 IV/7 - 3D Indoor Modelling and Navigation 2

Session Chair: Masafumi Nakagawa, Shibaura Institute of Technology  
Session Co-Chair: Qing Zhu, Southwest Jiaotong University

**08:30** Indoor Navigation from Point Clouds: 3D Modelling and Obstacle Detection  
Lucía Díaz-Vilariño, University of Salamanca, Spain; University of Vigo, Spain

**08:48** Rasterization and voxelization of 2-d and 3-d space partitionings  
Ben Gorte, TU Delft, The Netherlands

**09:06** Combining geometric context and orientation map for indoor corridor modeling from a single imagery  
Gunho Sohn, York University, Canada

**09:24** BIM-GIS Integrated Geospatial Information Model Using Semantic Web and RDF Graphs  
El-Hadi Hor, GeolCT, Lab, York University, Canada

**09:42** Position, Location, Place and Area: An Indoor Perspective  
George Sithole, University of Cape Town, South Africa

## 15/7 08:30 - 10:00 NMCAF+SAF - JS1 High-resolution satellite imaging for geo-spatial information

Session Chair: Jun Chen, ISPRS/National Geomatics Center of China

**08:30** Bringing space to the ground – UNOSAT earth observation solutions with practical impact  
Einar Bjorgo, UNOSAT

**08:52** Operational remote sensing services in North Eastern Region of India for natural resources management, early warning for disaster risk reduction and knowledge dissemination  
P.L.N. Raju, North Eastern Space Applications Centre, Shillong, India

**09:14** Towards InSAR everywhere, all the time, with Sentinel-1  
Zhenhong Li, Newcastle University, United Kingdom

**09:36** Societal benefits of high resolution satellite data: Indian Experiences  
Shailesh Nayak, Earth System Science Organisation, India

## 15/7 08:30 - 10:00 V/5 - Close-range Measurements for Biomedical Sciences and Geosciences 2

Session Chair: Hans-Gerd Maas, TU Dresden  
Session Co-Chair: Simon John Buckley, Uni Research AS

**08:30** The potential of low-cost RPAS for multi-view reconstruction of sub-vertical rock faces  
Riccardo Roncella, University of Parma, Italy

**08:48** A review of hyperspectral imaging in close range applications  
Simon Buckley, Uni Research CIPR, Norway

**09:06** Towards a Low-Cost, Real-Time Photogrammetric Landslide Monitoring System Utilising Mobile and Cloud Computing Technology  
Polpreecha Chidburee, Newcastle University, United Kingdom

**09:24** Evaluating dense 3d reconstruction software packages for oblique monitoring of

## crop canopy surface

Sebastian Brocks, University of Cologne, Germany

### 15/7 08:30 - 10:00 VII/ThS 15 - The quest for objects – does Geographic Object-based Image Analysis meet society's needs?

Session Chair: Thomas Blaschke, University of Salzburg

Session Co-Chair: Geoffrey Hay, University of Calgary

#### 08:30 Object-based image analysis beyond remote sensing - the human perspective

Thomas Blaschke, University of Salzburg, Austria

#### 08:48 Object-based image analyses for the assessment of mineral extraction in conflict regions of the Democratic Republic of the Congo

Olaf Kranz, University of Salzburg, Austria; Helmholtz Association of German Research Centres, Germany

#### 09:06 Does the data resolution/origin matter? Satellite, airborne and UAV imagery to tackle plant invasions

Jana Müllerová, Institute of Botany CAS, Czech Republic

#### 09:24 Improving the quality of segmentation for road extraction in urban areas

Mehdi Maboudi, University of Tehran, Iran

### 15/7 10:30 - 12:00 Elsevier Session II

#### 10:30 Publishing innovations workshop: 'Changes in the publishing landscape'

### 15/7 10:30 - 12:00 I/4 - Geometric and Radiometric Modeling of Optical Airborne and Spaceborne Sensors 1

Session Chair: Peter Reinartz, DLR

Session Co-Chair: Rupert Mueller, DLR

#### 10:30 Kernel MAD Algorithm for Relative Radiometric Normalization

Ping Tang, Chinese Academy of Sciences, China

#### 10:48 Radiometric normalization of large airborne image data sets acquired by

## different sensor types

Stephan Gehrke, Hexagon Geosystems, Switzerland

#### 11:06 Distripping for TDICCD remote sensing image based on static features of histogram

Hui-ting GAO, Beijing Institute Of Space Mechanics & Electricity, China

### 15/7 10:30 - 12:00 I/Vb - Unmanned Vehicle Systems (UVS): Sensors and Applications 4

Session Chair: Görres Jochen Grenzdörffer, Rostock University

Session Co-Chair: Francesco Nex, University of Twente - ITC Faculty

#### 10:30 Non-destructive Monitoring of Rice by hyperspectral in-field Spectrometry and UAV-based Remote Sensing: Case Study of field-grown Rice in North Rhine-Westphalia, Germany

Maximilian Willkomm, University of Cologne, Germany

#### 10:48 Light-weight multispectral UAV sensors and their capabilities for predicting grain yield and detecting plant diseases

Stephan Nebiker, FHNW University of Applied Sciences and Arts Northwestern Switzerland, Switzerland

#### 11:06 UAV-based remote sensing for grassland monitoring

Marcel Possoch, University of Cologne, Germany

#### 11:24 Using remote sensing and RPAS for archaeology and monitoring in western Greenland

Karel Pavelka, Czech Technical University in Prague, Czech Republic

### 15/7 10:30 - 12:00 II/5 - GeoComputation and GeoSimulation

Session Chair: James Haworth, University College London

Session Co-Chair: Jan Boehm, UCL

#### 10:30 Sideload – Ingestion of Large Point Clouds into the Apache Spark Big Data Engine



Jan Boehm, UCL, United Kingdom

## **10:48 Geosimulation Modeling Approach for 3D Urban Densification Developments**

Suzana Dragicevic, Simon Fraser University, Canada

## **11:06 A conceptual framework for virtual geographic environments knowledge engineering**

Lan You, Chinese University of Hong Kong, Hong Kong S.A.R. (China); Hubei University, China

## **11:24 A high-performance method for simulating surface rainfall-runoff dynamics using particle system**

Fangli Zhang, Shenzhen University, China; Hong Kong Baptist University, Hong Kong, China

## **11:42 Lateral flooding associated to wave flood generation on river surface**

Carolina Ramirez-Nunez, Ruprecht Karls Universität Heidelberg, Germany

## **15/7 10:30 - 12:00 III/1 - Orientation and Surface Reconstruction 2**

Session Chair: Olaf Hellwich, Technical University Berlin

Session Co-Chair: Helmut Mayer, Bundeswehr University Munich

## **10:30 Image-guided non-local dense matching with three-steps optimization**

Yongjun Zhang, Wuhan University, China

## **10:48 Structureless bundle adjustment with self-calibration using accumulated constraints**

Alessandro Cefalu, University of Stuttgart, Germany

## **11:06 Fast and Resistant Procrustean Bundle Adjustment**

Andrea Fusiello, Università di Udine, Italy

## **11:24 Rectification and robust matching using oriented image triplets for minimally invasive surgery**

Niklas Conen, Jade University of Applied Sciences, Germany

## **11:42 Convex image orientation from relative orientations**

Martin Reich, Leibniz Universität Hannover, Germany

## **15/7 10:30 - 12:00 NMCAF+SAF - JS2 Challenges**

Session Chair: Gregory Scott, UN-GGIM

## **10:30 Earth Observation: Towards the Exabyte Era**

Wolfgang Wagner, Technische Universität Wien, Austria

## **10:52 Geo-brokering, a mission and a challenge for national mapping and cadastral agencies**

Ingrid Vanden Berghe, IGN Belgium

## **11:14 What Happens When You Combine Machine Learning and Satellite Imagery**

Giovanni Marchisio, DigitalGlobe, USA

## **11:36 Planetary Scale Data Processing and Management with Google Earth Engine**

Noel Gorelick, Google, USA

## **15/7 10:30 - 12:00 V/1 - Vision Metrology 2**

Session Chair: Mark Shortis, RMIT University  
Session Co-Chair: Thomas Luhmann, Jade University of Applied Sciences

## **10:30 Close range calibration of long focal length lenses in a changing environment**

Stuart Robson, UCL, United Kingdom

## **10:48 Experiments on calibrating tilt-shift lenses for close-range photogrammetry**

Erica Nocerino<sup>1</sup>, 3D Optical Metrology (3DOM) unit, Bruno Kessler Foundation (FBK), Italy

## **11:06 Influence of raw image preprocessing and other selected processes on accuracy of close-range photogrammetric systems according to VDI 2634**

Jan Reznicek, Jade University of Applied Sciences, Germany

## **11:24 External verification of the bundle adjustment in photogrammetric software using the Damped Bundle Adjustment Toolbox**

Niclas Börlin, Umeå University, Sweden

## **11:42 Observations on the performance of x-ray computed tomography for dimensional metrology**

Hannah Clare Corcoran, UCL, United Kingdom; 2NPL, United Kingdom

## 15/7 10:30 - 12:00 VI/3 - Promotion of International Collaborative Education Programs + VI/5 - Promotion of the Profession to Young People

Session Chair: Maria Grazia D'Urso, University of Cassino and Southern Lazio

Session Co-Chair: Juan Gregorio Rejas, Universidad Politécnica de Madrid

**10:30** Concept and Practice of Teaching Technical University Students to Modern Technologies of 3D Data Acquisition and Processing: A Case Study of Close-Range Photogrammetry and Terrestrial Laser Scanning

Kravchenko Julia, Kyiv National University of Construction and Architecture, Ukraine

**10:48** The 'Moon Mapping' Project to Promote Cooperation Between Students of P.R. China and Italy

Marco Scaioni, Politecnico di Milano, Italy

**11:06** Close-range sensing techniques in alpine terrain

Martin Rutzing, Austrian Academy of Sciences, Austria; University of Innsbruck, Austria

**11:24** Implementation of active teaching methods and emerging topics in photogrammetry and remote sensing

Mojca Kosmatin Fras, University of Ljubljana, Slovenia

**11:48** The Use of UAS for Rapid 3D Mapping in Geomatics Education

Peter Tian-Yuan Shih, National Chiao Tung University, Taiwan

## 15/7 10:30 - 12:00 VII/3 - Information Extraction from Hyperspectral Data 1: Spectral based information for Thematic Mapping

Session Chair: Eyal Ben-Dor, Tel Aviv University

Session Co-Chair: Anna Brook, University of Haifa

**10:30** Spatial-spectral Classification Based on the Unsupervised Convolutional Sparse Auto-encoder for Hyperspectral Remote Sensing Imagery

Xiaobing Han, Wuhan University, China

**10:48** Virtual dimensionality estimation in hyperspectral imagery based on unsupervised feature selection

Mohsen Ghamary Asl, Toosi University of Technology, Iran

**11:06** Evaluating the initialization methods of wavelet networks for hyperspectral image classification

Pai-Hui Hsu, National Taiwan University, Taiwan

**11:24** Geometric and reflectance signature characterization of complex canopies using hyperspectral stereoscopic images from UAV and terrestrial platforms

Eija Honkavaara, Finnish Geospatial Research Institute, Finland

## 15/7 10:30 - 12:00 VIII/3 - Weather, Atmosphere and Climate Studies

Session Chair: Konrad Schindler, ETH Zurich  
Session Co-Chair: Nicolas Paparoditis, IGN

**10:30** Determination of Methane sources globally by SCIAMACHY

Jonggeol Park, Tokyo University of Information Sciences, Japan

**10:48** A Novel Index for Atmospheric Aerosol types Categorization with Spectral Optical Depths from Satellite Retrieval

Tang-Huang Lin, National Central University, Taiwan

**11:06** The climate of the Canary Islands by Annual Cycle Parameters

Benjamin Bechtel, University of Hamburg, Germany

**11:24** Investigating land surface temperature changes using Landsat data in Konya, Turkey

Osman Orhan, Selcuk University, Turkey

**11:42** Spatiotemporal evaluation of nocturnal cold air drainage over a simple slope using thermal infrared imagery

Vahid Ikani, University of Sherbrooke, Canada

**15/7 13:30 - 15:00 I/Vb - Unmanned Vehicle Systems (UVS): Sensors and Applications 5**

Session Chair: Babak Ameri, GEOSYS Technology Solutions  
Session Co-Chair: Wolfgang Förstner, Universität Bonn

**13:30** Monitoring of coastal changes including shallow under water areas around the bird island Langenwerder with UAS and bathymetric laser surveys  
Görres Jochen Grenzdörffer, Rostock University, Germany

**13:48** Co-Registration of Multitemporal UAV Image Datasets for Monitoring Applications: A New Approach  
Irene Aicardi, Politecnico di Torino, Italy

**14:06** High-resolution debris flow volume mapping with unmanned aerial systems (UAS) and photogrammetric techniques  
Marc Adams, Austrian Forest Research Center (BFW), Austria

**14:24** Possibilities of using lidar and photogrammetric data obtained with unmanned aerial system for levees monitoring  
Wienczyslaw Plutecki, MSP Marcin Szender, Poland

**15/7 13:30 - 15:00 II/6 - Geovisualization and Virtual Reality 1**

Session Chair: Bo Wu, The Hong Kong Polytechnic University  
Session Co-Chair: Susanne Bleisch, FHNW University of Applied Sciences and Arts Northwestern Switzerland

**13:30** Direct Image-to-Geometry Registration Using Mobile Sensor Data  
Christian Kehl, Uni Research AS - Centre for Integrated Petroleum Research, Norway; University of Bergen, Norway

**13:48** Gaze and Feet as Additional Input Modalities for Interacting with Spatial Data  
Arzu Coltekin, University of Zurich, Switzerland

**14:06** Impact of Schematic Designs on the Cognition of Underground Tube Maps

Zhilin Li, Hong Kong Polytechnic University

**14:24** Do the visual complexity algorithms match the generalization process in geographical displays?  
Arzu Coltekin, University of Zurich, Switzerland

**14:42** Animation Strategies for Smooth Transformations Between Discrete LODs of 3D Building Models  
Martin Kada, Technische Universität Berlin, Germany

**15/7 13:30 - 15:00 III/cloud - 3D Semantic Point Cloud Challenge**

Session Chair: Konrad Schindler, ETH Zurich  
Session Co-Chair: Roderik Lindenbergh, TU Delft

**13:30** Invited talk  
Nicolas Paparoditis, IGN, France

**14:10** Introduction of the 3D semantic point cloud challenge  
Timo Hackel, ETH Zürich, Switzerland

**14:30** Presentation of baseline methods  
Timo Hackel, ETH Zürich, Switzerland

**14:50** Questions / discussion

**15/7 13:30 - 15:00 IV/1 - Methods for the Update and Verification of Geospatial Databases 2**

Session Chair: Petra Helmholz, Department of Spatial Sciences, Curtin University  
Session Co-Chair: Giorgio Agugiaro, AIT - Austrian Institute of Technology

**13:30** Contextual land use classification: How detailed can the class structure be?  
Lena Albert, Leibniz Universität Hannover, Germany.

**13:48** Methods for the Update and Verification of Forest Surface Model  
Marie Brenova, University of Defence, Czech Republic

**14:06** Primary creating of Central spatial database of the Slovak Republic and the procedures of revision  
Maroš Miškolci, Topografický ústav Banská Bystrica, Slovakia



## **14:24 Using third party data to update a reference dataset in a quality evaluation service**

Emerson M. A. Xavier, Brazilian Army Geographic Service, Brazil; University of Jaen, Spain

## **14:42 Evaluation of model recognition for grammar-based automatic 3d building model reconstruction**

Qian Yu, Curtin University, Australia

## **15/7 13:30 - 15:00 IV/4 - Geospatial Data Infrastructure 2**

Session Chair: Dev Raj Paudyal, University of Southern Queensland

Session Co-Chair: E. Pattabhi Rama Rao, Indian National Centre for Ocean Information Services

## **13:30 A discussion about effective ways of Basic Resident Register on GIS**

Naoya Oku, Kokusai Kogyo co.,ltd., Japan

## **13:48 A Virtual Hub Brokering Approach for Integration of Historical and Modern Maps**

Nazarena Bruno, University of Parma, Italy

## **14:06 Design for Connecting Spatial Data Infrastructures With Sensor Web (SENSDI)**

Devanjan Bhattacharya, University Nova Lisboa, Portugal

## **14:24 Visual analysis**

Haiyan Liu, Institution of surveying and mapping, China

## **14:42 Data Archiving and Distribution of LiDAR and Derived Datasets in the Philippines**

Mark Edwin Tupas, University of the Philippines, Philippines

## **15/7 13:30 - 15:00 NMCAF+SAF - JS3 Future prospects**

Session Chair: Gunter Schreier, DLR

## **13:30 Wrapping up NMCAF**

Julius Ernst OVG- Austrian Society for Surveying and Geoinformation, Austria

## **13:35 Wrapping up SAF**

Ian Dowman UCL, United Kingdom

## **13:40 Panel discussion**

Ingrid Vanden Berghe, IGN Belgium

## **13:40 Panel discussion**

Nicolas Paparoditis, IGN, France

## **13:40 Panel discussion**

Gregory Scott, UN-GGIM

## **13:40 Panel discussion**

Yamamoto Shizuo, JAXA

## **13:40 Panel discussion**

Larson Wade, UrtheCast

## **13:40 Panel discussion**

Lawrence Friedl, NASA

## **15/7 13:30 - 15:00 V/2 - Cultural Heritage Data Acquisition and Processing: Direct point cloud acquisition methods**

Session Chair: Fulvio Rinaudo, POLITECNICO DI TORINO

Session Co-Chair: Mikhail Vavulin, Tomsk State University

## **13:30 See-Through Imaging of Laser-Scanned 3D Cultural Heritage Objects Based on Stochastic Rendering of Large-Scale Point Clouds**

Satoshi Tanaka, Ritsumeikan University, Japan

## **13:48 Multispectral analysis of indigenous rock art using terrestrial laser scanning**

David Belton, Curtin University, Australia

## **14:06 BIM from laser scans... not just for buildings: NURBS-based parametric modeling of a medieval bridge**

Luigi Barazzetti, Politecnico di Milano, Italy

## **14:24 Virtual reconstruction of lost architectures: from the TLS survey to AR interaction**

Roberto Pierdicca, Polytechnic University of Marche, Italy

## **15/7 13:30 - 15:00 VII/4 - Methods for Image Classification 5**

Session Chair: Viktoriya Tsyganskaya, Ludwig Maximilians University Munich

Session Co-Chair: Ping Zhong, National university of defense technology

## **13:30 SPMK and grab-cut based target extraction from high resolution remote**

sensing images

Weihong Cui, Wuhan University, China,  
Collaborative Innovation Center for  
Geospatial Technology, China; University of  
Waterloo, Canada

**13:48 Accounting for variance in  
hyperspectral data coming from limitations  
of the imaging system**

Boris Mikhailovich Shurygin, Moscow  
Institute of Physics and Technology (State  
University), Russia

**14:06 Benchmarking Deep Learning  
Frameworks for the Classification of High  
Resolution Satellite Multispectral Data**

Maria Papadomanolaki, National Technical  
University of Athens, Greece

**14:24 Balanced vs Imbalanced Training  
Data: Classifying Rapideye Data with  
Support Vector Machines**

Fusun Balik Sanli, Yildiz Technical University,  
Turkey

**15/7 13:30 - 15:00 VIII/4 - Water Resources  
1**

Session Chair: Shaini Naha, Indian Institute of  
Remote Sensing

**13:30 Automated wetland delineation  
from multi-frequency and multi-polarized  
SAR images in high temporal and spatial  
resolution**

Linda Moser, GAF AG, Germany

**13:48 Utilization of landsat data for water  
quality observation in small inland water  
bodies**

Miroslav Páslér, University of Pardubice,  
Czech Republic

**14:06 Improved correction method for  
water-refracted terrestrial laser scanning  
data acquired in the mountain channel**

Naoko Miura, The University of Tokyo, Japan

**14:24 Automatic River Network Extraction  
from LiDAR Data**

Eduardo Nuñez Maderal, National Mapping  
Agency of Spain, Spain

**14:42 Digital survey techniques for  
documentation of wooden shipwreck**

Elisa Costa, IUAV University of Venice, Italy

**15/7 15:00 - 16:30 Interactive session**

(II/6, III/4, III/VII, IV/1, IV/4, IV/7, V/5,  
VI/3, VI/4, VI/5, VIII/3, VIII/4, VIII/5,  
ThS15)

**II/6 - Geovisualization and Virtual Reality**

**VISA: An Automatic Aware and Visual Aids  
Mechanism for Improving the Correct Use  
of Geospatial Data**

Yu-Ting Su, National Cheng Kung University,  
Taiwan

**Integration of images and lidar point  
clouds for building façade texturing**

Liang-Chien Chen, National Central  
University, Taiwan

**Underwater 3d modeling: image  
enhancement and point cloud filtering**

Ioanna Sarakinou, Aristotle University of  
Thessaloniki, Greece

**The effectiveness of panoramic maps  
design: a preliminary study based on mobile  
eyetracking**

Raffaella Balzarini, Inria Grenoble Rhône-  
Alpes, France.

**A virtual globe-based multi-resolution  
TIN surface modeling and visualization  
method**

Xianwei Zheng, Wuhan University, China

**Precise visualization method for cultural  
heritage-the case of high-resolution Read  
Relief Image Map used for study of Royal  
City of Angkor Thom, Cambodia**

Tatsuro Chiba, Asia Air Survey co., Ltd., Japan

**Mosaicking Mexico - The Big Picture of  
Big Data**

Shawn Melamed, PCI Geomatics

**Exploratory user study to evaluate the  
effect of street name changes on route  
planning using 2D maps**

Serena Coetzee, University of Pretoria, South  
Africa

**Quality aspects of aerial digital  
orthophotos, the producers point of view**

Albert Wiedemann, University of Applied  
Sciences Erfurt, Germany

**Ground surface visualization using Red**

## **Relief Image Map for a variety of map scales**

*Bateer Hasi, Asia Air Survey, Co., Ltd, Japan*

## **III/4 - 3D Scene Analysis**

### **Automatic Generation of Building Models with Levels of Detail 1-3**

*Martin Drauschke, German Aerospace Center, Germany*

### **Analysis of a Graph Based Model for the Detection of River Networks Using Marked Point Processes**

*Alena Schmidt, Leibniz Universität Hannover, Germany*

### **Hierarchical higher order CRF for the classification of airborne lidar point clouds in urban areas**

*Joachim Niemeyer, Leibniz Universität Hannover, Germany*

### **Automatic extraction and regularization of building outlines from airborne lidar point clouds**

*Bastian Albers, Universität Osnabrück*

### **Inlining 3D reconstruction, multi-source texture mapping and semantic analysis using oblique aerial imagery**

*Dirk Frommholz, DLR, Germany*

### **Automatic road sign inventory using mobile mapping systems**

*Mario Soilán, Universidad de Vigo, Spain*

### **An Improved Snake Model for Refinement of Lidar-Derived Building Roof Contours Using Aerial Images**

*Shugen Wang, Wuhan University, China*

### **Fast and robust segmentation and classification for change detection in urban point clouds**

*Xavier Roynard, MINES ParisTech, PSL Research University, France*

### **Application for 3d scene understanding in estimating discharge of domestic waste along complex urban rivers**

*Yazid Ninsalam, National University of Singapore; Singapore-ETH Centre, Future Cities Laboratory*

### **Classification of photogrammetric point**

### **clouds of scaffolds for construction site monitoring using subspace clustering and pca**

*Yusheng Xu, Technische Universität München, Germany*

### **Efficient semantic segmentation of man-made scenes using fully connected crfs**

*Michael Ying Yang, TU Dresden, Germany*

### **Ray-based detection of openings in urban areas using mobile LIDAR data**

*Thomas Collet, Siradel, France*

### **Comparison between two 3d building reconstruction approaches - point cloud based vs. image processing based**

*Dennis Dahlke, Deutsches Zentrum für Luft- und Raumfahrt, Germany*

### **Vectorization of road data extracted from aerial and UAV imagery**

*Dimitri Bulatov, Fraunhofer IOSB, Germany*

### **A convolutional network for semantic facade segmentation and interpretation**

*Matthias Schmitz, Bundeswehr University Munich, Germany*

### **Automatic tree-crown detection in challenging scenarios**

*Dimitri Bulatov, Fraunhofer IOSB, Germany*

### **Semi-automatic building models and facade texture mapping from mobile phone images**

*Jongwon Jeong, Inha University, Korea*

### **Evaluation of SIFT and SURF for vision based localization**

*Xiaozhi Qu, Université Paris-Est, IGN, France*

### **Automatically determining scale for unstructured point clouds**

*Jayren Kadamen, University of Cape Town, South Africa*

### **Automatic building extraction and roof reconstruction in 3K imagery based on line segments**

*Alexander Köhn, German Aerospace Center (DLR), Germany*

### **Extraction of building boundary lines from airborne LiDAR point clouds**

*Yi-Hsing Tseng, National Cheng Kung*



*University, Taiwan,*

**Automatic 3D Building Reconstruction from a Dense Image Matching Dataset**

*Andrew Philip McClune, Newcastle University, United Kingdom*

**Object based image analysis combining high spatial resolution imagery and LiDAR point clouds**

*Yong Fang, Xi'an Institute of Surveying and Mapping*

**Impact of building heights on 3D urban density estimation from spaceborne stereo imagery**

*Feifei Peng, Wuhan University, China*

**Building change detection by combining LiDAR data and ortho image**

*Daifeng Peng, Wuhan University, China*

**Influence of GSD for 3D city modeling and visualization from aerial imagery**

*Zafar Alam, MOMRA, Saudi Arabia*

**III/VII - Pattern Analysis in Remote Sensing**

**A fully automated pipeline for classification tasks with an application to remote sensing**

*Kumiko Suzuki, Kokusai Kogyo Co., Ltd.*

**Single-image super resolution for multispectral remote sensing data using convolutional neural networks**

*Lukas Liebel, Technical University of Munich, Germany*

**Searching remotely sensed images for meaningful nested gestalten**

*Eckart Michaelsen, Fraunhofer IOSB, Germany*

**Beesmart – A crowdsourcing project with smartphones**

*Eberhard Gülch, Hochschule für Technik Stuttgart, Germany*

**Assessing the suitability of simulated SAR signatures of debris for the usage in damage detection**

*Silvia Dorothee Kuny, Fraunhofer IOSB, Germany*

**Hyperspectral image kernel sparse subspace clustering with spatial max**

**pooling operation**

*Hongyan Zhang, Ghent University, Belgium*

**Extraction of roof lines from high resolution images by a grouping method**

*Aluir Porfirio Dal Poz, São Paulo State University, Brazil*

**Image labeling for LiDAR intensity image using K-NN of feature obtained by convolutional neural network**

*Masaki Umemura, Meijo University*

**Using morphlet-based image representation for object detection**

*Vladimir Gorbatshevich, FGUP Gosniias, Russian Federation*

**No-reference image quality assessment for ZY-3 imagery in urban areas using statistical model**

*Yi Zhang, Wuhan University, China*

**Improvement and extension of shape evaluation criteria in multi-scale image segmentation**

*Mitsuteru Sakamoto, PASCO Corporation, Japan*

**Knowledge based 3D building model recognition using convolutional neural networks from LiDAR and aerial imageries**

*Fatemeh Alidoost, University of Tehran, Iran*

**Detecting linear features by spatial point processes**

*Dengfeng Chai, Zhejiang University, China*

**Fast drawing of traffic sign using mobile mapping system**

*Qi Yao, Wuhan University, China*

**Spatial-temporal pattern of vegetation index change and the relationship to land surface temperature in Zoige**

*Zheng Chen, Beijing Normal University, China*

**The land surface temperatures impact to the land cover types**

*Mohd Noor Norzailawati, International Islamic University Malaysia (IIUM), Malaysia*

**A novel ship detection method for large-scale optical satellite images based on visual LBP feature and visual attention model**

*Zhina Song, Wuhan University, China*

**Machine learning based road detection from high resolution imagery**

*Ye Lv, Wuhan University, China*

**Advanced extraction of spatial information from high resolution satellite data**

*Tomáš Pour, Palacký University Olomouc, Czech Republic*

## **IV/1 - Methods for the Update and Verification of Geospatial Databases**

**Data management framework of drone-based 3D model reconstruction of disaster site**

*Changyoon Kim, Korea Institute of Civil Engineering and Building Technology, Korea*

**The use of multiple data sources in the process of topographic maps updating**

*Adriana Cantemir, National Centre of Cartography, Romania*

**Road network generalization based on float car tracking**

*Cheng Zhou, WUST, China*

## **IV/4 - Geospatial Data Infrastructure**

**Automated reverse geocoding of cities for satellite images based on cascaded k nearest neighbor algorithm: a case study of Turkey**

*Alper Akoguz, Center for Satellite Communications and Remote Sensing, ITU, Turkey*

**The effect of pixel size on the accuracy of orthophoto production**

*Ferruh Yildiz, Selcuk University, Turkey*

**Geolocation support for water supply and sewerage projects in Azerbaijan**

*Magsad Huseyn Gojmanov, Baku State University, Azerbaijan*

## **IV/7 - 3D Indoor Modelling and Navigation**

**Video based indoor fingerprinting and positioning**

*Xing Zhang, Shenzhen University, China*

**A Laser-SLAM Algorithm for Indoor Mobile Mapping**

*Kai Sun, Ledor Spatial Information*

*Technology Co., China*

**The generation of building floor plans using portable and unmanned aerial vehicle mapping system**

*Guang-Je Tsai, National Cheng Kung University, Taiwan*

**A schema for extraction of indoor pedestrian navigation grid network from floor plans**

*Lei Niu, Henan University of Urban Construction, China*

**An indoor space partition method for fingerprint location considering pedestrian accessibility**

*Yue Xu, Nanjing Normal University, China*

**An Indoor Navigation Algorithm Considering Obstacles on 2D Plan**

*Shuangfeng Wei, Beijing University of Civil Engineering and Architecture, China; Key Laboratory for Urban Geomatics of National Administration of Surveying, Mapping and Geoinformation, China; Delft University of Technology, The Netherlands*

**A semantic model to define indoor space in context of emergency evacuation**

*Nishith Maheshwari, International Institute of Information Technology, India*

## **V/5 - Close-range Measurements for Bio-medical Sciences and Geosciences**

**Panorama Image Sets for Photogrammetric Terrestrial Surveys**

*Livia Piermattei, University of Padova, Italy*

**Mapping eroded areas on mountain grassland with terrestrial photogrammetry and object-based image analysis**

*Andreas Mayr, University of Innsbruck, Austria*

**Review of advances in Cobb angle calculation and image-based modeling of spinal deformities**

*Vasilis Giannoglou, Aristotle University of Thessaloniki, Greece*

**A simulation tool assisting the design of a close range photogrammetry system for the Sardinia Radio Telescope**

*Franco Buffa, Osservatorio Astronomico di Cagliari, INAF*

**Autonomous Robotic Inspection in Tunnels**

*Anastasios Doulamis, National Technical University of Athens, Greece*

**Exploitation of stereophotogrammetric measurement of a foot in analysis of plantar pressure distribution**

*Barbora Pánková, Charles University in Prague, Czech Republic*

**3D modelling and rapid prototyping for cardiovascular surgical planning – two case studies**

*Erica Nocerino, 3D Optical Metrology (3DOM) unit, Bruno Kessler Foundation (FBK), Italy*

**Deformation monitoring of retrofitted short concrete columns with laser sensor**

*Emin Ozgur Avsar, Istanbul Technical University, Turkey*

**Development of a UAV-based landslide monitoring system**

*Maria Valasia Peppas, Newcastle University, UK*

**Assessment of restoration methods of x-ray images with emphasis on medical photogrammetric usage**

*Sahar Hosseini, University of Tehran, Iran*

**4D animation reconstruction from multi-camera coordinates transformation**

*Jyun-Ping Jhan, National Cheng Kung University, Taiwan*

**A Photogrammetric Instrument for Underground Pipe Survey in the Well Bottom**

*Yongrong Li, Chinese Academy of Surveying and mapping, China*

**VI/3 - Promotion of International Collaborative Education Programs**

**A Framework for an Open Source Geospatial Certification Model**

*Franz-Josef Behr, Stuttgart University of Applied Sciences, Germany*

**VI/4 - Promotion of Regional Cooperation**

**and Regional Capacity Development in Geoinformatics**

**Filtering Techniques on Analysis of Archeology Areas Using Radarsat Images: Case Study of Lembah Bujang, Malaysia**

*Norzailawati Mohd Noor, International Islamic University of Malaysia, Malaysia*

**VI/5 - Promotion of the Profession to Young People**

**Contest of web-based geospatial applications for students and young scientists**

*Fuan Tsai, National Central University, Taiwan*

**Latest developments of the ISPRS Student Consortium**

*Ivan Detchev, University of Calgary, Canada*

**VIII/3 - Weather, Atmosphere and Climate Studies**

**Detection of dry intrusion on water vapour images over central Europe – June 2010 to September 2011**

*Petr Kolar, University of Defence, Czech Republic*

**Impact of level of details in the 3D reconstruction of trees for microclimate modeling**

*Elena Bournez, ICube laboratory, France*

**Sensitivity of land surface and Cumulus schemes for Thunderstorm prediction**

*Dinesh Kumar, Central University of Jammu, India*

**Determining the impacts of land cover/use categories on land surface temperature using Landsat 8-OLI**

*Emine Mujgan Ergene, Istanbul Technical University, Turkey*

**VIII/4 - Water Resources**

**Estimation of phosphorus emissions in the upper Iguazu basin (Brazil) using GIS and the MoRE model**

*Regina Tiemy Kishi, UFPR Federal University of Parana, Brazil*

**A Combined Approach with Smos and Modis to Monitor Agricultural Drought**



*Nilda Sanchez, Universidad de Salamanca, Spain*

**Optimal band ratio analysis of worldview-3 imagery for bathymetry of shallow rivers (case study: Sarca river, Italy)**

*Milad Niroumand-Jadidi, University of Trento, Italy; Freie Universität Berlin, Germany*

**Quantification of glacier depletion in the central Tibetan Plateau by using integrated satellite remote sensing and gravimetry**

*Kuo-Hsin Tseng, National Central University, Taiwan*

**Understanding the behavior of sediment and nutrient spread in nagarjuna sagar reservoir using temporal landsat data, Water Resources paper**

*Tarun Teja Kondraju, IIIT-HYDERABAD, India*

**Change detection of lake Aba Samuel in Ethiopia**

*Romuald Kaczynski, Military University of Technology, Poland*

**Remote Sensing Application of the Geophysical Changes in the Coastlines and Rivers of Zambales, Philippines**

*Annie Melinda Paz-Alberto, Central Luzon State University, Philippines*

**Assesment of surface water from sobradinho's resorvoir under drought effects using multi-temporal landsat images**

*Erivaldo Antonio da Silva, FCT - UNESP, Brazil*

**Relation between GRACE-derived water storage change and precipitation over Kaidu River Basin, China**

*Junyi Huang, Hong Kong Baptist University, Hong Kong S.A.R. (China)*

**A study of water pollution early warning framework based on Internet of things**

*Chengfang Hu, Changjiang River Scientific Research Institute, China*

**Evaluation of rainfall-runoff models for mediterranean subcatchments**

*Ahmet Cilek, University of Cukurova, Turkey*

## VIII/5 - Energy & Geological Applications

**Gold mineral prospecting using Phased Array type L-band Synthetic Aperture Radar (PALSAR) satellite remote sensing data, Central Gold Belt, Malaysia**

*Amin Beiranvand Pour, Universiti Teknologi Malaysia, Malaysia*

**Detection and Discrimination of the Thick Oil Patches on the Sea Surface**

*Dominique Dubucq, TOTAL, France*

**Application of PALSAR-2 remote sensing data for landslide hazard mapping in Kelantan river basin, Peninsular Malaysia**

*Amin Beiranvand Pour, Universiti Teknologi Malaysia, Malaysia*

**GIS-Based Wind Farm Site Selection Model in the Emirate of Abu Dhabi, Uae**

*Nazmi Saleous, UAE University, United Arab Emirates*

## ThS 15 - The quest for objects – does Geographic Object-based Image Analysis meet society's needs?

**Improvement evaluation on ceramic roof extraction using WORLDVIEW-2 imagery and geographic data mining approach**

*Vanessa da Silva Brum-Bastos, University of St Andrews*

## **15/7 16:30 - 18:00 I/2 - LiDAR, SAR and Optical Sensors for Airborne and Spaceborne Platforms 3**

**Session Chair:** Charles K Toth, The Ohio State University

**Session Co-Chair:** Norbert Haala, University of Stuttgart

**16:30 Mobile mapping by fmcw synthetic aperture radar operating at 300 GHz**

*Stephan Palm, Fraunhofer FHR, Germany*

**16:48 Geometric Quality Assessment of Lidar Data Based on Swath Overlap**

*Aparajithan Sampath, SGT, Contractor to US Geological Survey, USA*

**17:06 HOPC: A Novel Similarity Metric Based on Geometric Structural Properties for Multi-Modal Remote Sensing Image Matching**

Yuanxin Ye, Southwest Jiaotong University, China

**17:24 Medium format camera evaluation based on the latest PHASE ONE technology**  
Tobias Toelg, Phase One A/S, Denmark

## 15/7 16:30 - 18:00 II/6 - Geovisualization and Virtual Reality 2

Session Chair: Arzu Coltekin, University of Zurich

Session Co-Chair: Christopher James Pettit, UNSW Australia

**16:30 Investigating the use of 3D geovisualizations for urban design in informal settlement upgrading in South Africa**  
Victoria Rautenbach, University of Pretoria, South Africa

**16:48 Towards the development of a taxonomy for visualisation of streamed geospatial data**  
Bolelang Sibolla, CSIR, South Africa

**17:06 On the Usability and Usefulness of 3D (Geo)Visualizations and Virtual Reality**  
Arzu Coltekin, University of Zurich, Switzerland

**17:24 Challenges of a modern atlas of the Ageing Society**  
Susanne Bleisch, FHNW University of Applied Sciences and Arts Northwestern Switzerland, Switzerland

**17:42 Integration of GIS and BIM for indoor geovisual analytics**  
Bo Wu, The Hong Kong Polytechnic University, Hong Kong S.A.R. (China)

## 15/7 16:30 - 18:00 III/4 - 3D Scene Analysis 2

Session Chair: Markus Gerke, University of Twente

Session Co-Chair: Bruno Vallet, IGN

**16:30 Iterative re-weighted instance transfer for domain adaptation**  
Andreas Paul, Leibniz Universität Hannover, Germany

**16:48 Potential of Multi-Temporal Oblique Airborne Imagery for Structural Damage Assessment**  
Anand Vetrivel, University of Twente,

Netherlands

**17:06 Joint simultaneous reconstruction of regularized building superstructures from low-density LIDAR data using ICP**  
Andreas Wichmann, Technische Universität Berlin, Germany

**17:24 A global solution to topological reconstruction for building roof models from airborne lidar point clouds**  
Jie Shan, Wuhan University; Purdue University

**17:42 Incremental Refinement of Façade Models with Attribute Grammar from 3D Point Clouds**  
Youness Dehbi, University of Bonn, Germany

## 15/7 16:30 - 18:00 IV/3 - Global DEM Interoperability 2

Session Chair: Jan-Peter Muller, UCL Mullard Space Science Laboratory

Session Co-Chair: Dean Gesch, U.S. Geological Survey

**16:30 Validation of 'AW3D' global DSM generated from ALOS PRISM**  
Junichi Takaku, Remote Sensing Technology Center of Japan, Japan

**16:48 Generation of the 30 m-mesh global digital surface model by ALOS PRISM**  
Takeo Tadono, Japan Aerospace Exploration Agency, Japan

**17:06 Vertical accuracy assessment of 30-m resolution ALOS, ASTER, and SRTM global DEMs over northeastern Mindanao, Philippines**  
Jojene Santillan, Caraga State University, Philippines

**17:24 ICESAT validation of TANDEM-X I-DEM over the UK**  
Lang Feng, University College London, United Kingdom

**17:42 Comparative analysis of global digital elevation models and ultra-prominent mountain peaks**  
Carlos H., Grohmann, University of Sao Paulo, Brazil

## 15/7 16:30 - 18:00 V/5 - Close-range Measurements for Biomedical Sciences and Geosciences 3

Session Chair: Danilo Schneider, Technische Universität Dresden

Session Co-Chair: Patrik Meixner, Primis spol. s r. o.

**16:30** 3D geological outcrop characterization: Automatic detection of 3D planes (azimuth and dip) using LiDAR point clouds  
Katharina Anders, Heidelberg University, Germany

**16:48** Mapping alpine vegetation location properties by dense matching  
Robert Niederheiser, Austrian Academy of Sciences, Austria

**17:06** Synergetic Fusion of UAV and TLS Data for Soil Erosion Assessment  
Anette Eltner, Technische Universität Dresden, Germany

**17:24** A comparison of UAV and TLS data for soil roughness assessment  
Milutin Z Milenkovic, Vienna University of Technology, Austria

**17:42** Generation and comparison of TLS and SfM based 3D models of solid shapes in hydromechanic research  
Danilo Schneider, Technische Universität Dresden, Germany

## 15/7 16:30 - 18:00 VII/SpS 16 - EARSeL: Imaging Spectroscopy in environmental analyses

Session Chair: Klaus-Ulrich Komp, EFTAS Remote Sensing Transfer of Technology

Session Co-Chair: Lucie Homolová, Global Change Research Institute

**16:30** Supporting Management of European Refugee Streams by Earth Observation and Geoinformation  
Klaus-Ulrich Komp, EFTAS Remote Sensing Transfer of Technology, Germany

**16:48** Identification of a robust lichen index for the deconvolution of lichen and rock mixtures using pattern search algorithm (case study: Greenland)

Sara Salehi, University Of Copenhagen; Geological Survey of Denmark and Greenland,

**17:06** Task-dependent Band-Selection of Hyperspectral Images by Projection-Based Random Forests  
Ronny Haensch, Technische Universität Berlin, Germany

**17:24** Influence of the Viewing Geometry on Hyperspectral Data Retrieved from UAV Snapshot Cameras  
Helge Aasen, Institut of Geography, Germany

**17:42** Estimation of forest biochemical and structural properties from airborne imaging spectroscopy data  
Lucie Homolová, Global Change Research Institute, Czech Republic

## 15/7 16:30 - 18:00 VIII/4 - Water Resources 2

Session Chair: Miroslav Pásler, University of Pardubice

Session Co-Chair: Linda Moser, German Aerospace Center (DLR)

**16:30** Spatiotemporal dynamics of surface water extent from three decades of seasonally continuous Landsat time series at subcontinental scale  
Mirela Tulbure, University of New South Wales, Australia

**16:48** Long-term monitoring of water dynamics in the Sahel region using the Multi-SAR-System  
Adina Bertram, German Aerospace Center, Germany; Sachverständigenbüro für Luftbildauswertung und Umweltfragen, Germany

**17:06** An original processing method of satellite altimetry for estimating water levels and volume fluctuations in a series of small lakes of the Pantanal wetland complex in Brazil  
Paulo Henrique da Costa, Universidade Federal de Minas Gerais, Brazil

**17:24** Hydrological modelling and data assimilation of satellite based snow cover area using a variable infiltration capacity macro scale land surface model



Shaini Naha, Indian Institute of Remote Sensing, India

**17:42 Validation of Satellite Precipitation (TRMM 3B43) in Ecuadorian Coastal Plains, Andean Highlands and Amazonian Rainforest**

Daniela Ballari, University of Cuenca, Ecuador

**17:30 How to give a presentation**

Shunji Murai, Japan Earthquake Science Exploration Agency, Japan  
photogrammetric point clouds of scaffolds for construction site monitoring using subspace clustering and pca

**15/7 16:30 - 18:00 VIII/5 - Energy & Geological Applications**

Session Chair: SM Ramasamy, Bharathidasan university

Session Co-Chair: Rao Sriramachandra Divi, Kuwait University

**16:30 Geological mapping by combining spectral unmixing and cluster analysis for hyperspectral data**

Yasushi Yamaguchi, Nagoya University, Japan

**16:48 Development of a Multi-Site and Multi-Device Webgis-Based Tool for Tidal Current Energy Development**

Ma. Rosario Concepcion Ortiz Ang, University of the Philippines Diliman, Philippines

**17:06 Thermal Remote sensing - New algorithm**

Nithiyanandam Yogeswaran, TERI University, India

**17:24 Geological mapping using machine learning algorithms**

Alexander Stanford Harvey, Queen's University

**17:42 Anomaly identification from super-low frequency electromagnetic data for coalbed methane detection**

Shanshan Zhao, Peking University, China

**15/7 16:30 - 18:00 White Elephant Session**

Session Chair: Armin Gruen, ETH Zurich

**16:30 How to write a thesis**

Armin Gruen, ETH Zurich, Switzerland

**17:00 How to prepare a project proposal**

Gottfried Konecny, Leibniz University Hannover, Germany



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8

PROGRAM XXIII ISPRS  
SATURDAY 16 JULY





## Saturday, 16 July, 2016

TIME	LOCATION	SESSION
08:30 - 10:00	Congress Hall	Plenary 2
10.30 - 12:00	Club B	I/3 - Multi-Platform Multi-Sensor System Calibration 3
	Club H	II/3 - Spatial Analysis and Data Mining 2
	Club C	III/3 - Image Sequence Analysis 2
	Club A	IV/8 - Planetary Mapping and Spatial Databases 2
	Club E	V/4 - Terrestrial 3D Modelling: Algorithms and Methods 2
	Club D	VII/2 - DEM Generation and Surface Deformation Monitoring from SAR Data + SpS 14 - IAG: Imaging Geodesy
	Meeting Hall I B	VIII/8 - Land Cover and its Dynamics, Including Agricultural & Urban Land Use 1
13:30 - 15:00	Club H	I/2 - LiDAR, SAR and Optical Sensors for Airborne and Spaceborne Platforms 4
	Club C	II/4 - Spatial Statistics and Uncertainty Modeling
	Club D	II/ThS 12 - Location-based Social Media Data
	Club A	IV/5 - Web and Cloud Based Geospatial Services and Applications 2 + SpS 6 - ICA: LBS and ubiquitous cartography
	Club B	IV/II - Computing Optimization for Spatial Databases and Location based Services + IV/II/VIII - Global Land Cover Mapping and Services + IV/6 - Sensor Web and Internet of Things 1
	Club E	V/SpS 1 - CIPA: Geospatial Technology for Cultural Heritage
	Meeting Hall I A	VII/ThS 6 - Persistent Scatterer Interferometry
15:00 - 16:30	Meeting Hall I B	VIII/6 - Cryosphere 1
	Foyer 3rd Floor	Interactive session (I/1, I/3, II/4, III/2, IV/5, IV/II, V/4, VII/2, VIII/6, ThS4, ThS7, ThS9,
16:30 - 18:00	Club B	I/4 - Geometric and Radiometric Modeling of Optical Airborne and Spaceborne Sensors 2
	Club H	III/2 - Point Cloud Processing 2
	Club A	IV/8 - Planetary Mapping and Spatial Databases 3

	Club C	IV/ThS 9 - In-door and out-door seamless location and navigation
	Club E	V/3 - Terrestrial 3D Imaging and Sensors 2
	Club D	VII/ThS 7 - Information extraction from SAR imagery
	Meeting Hall I A	VIII/6 - Cryosphere 2
	Meeting Hall I B	VIII/8 - Land Cover and its Dynamics, Including Agricultural & Urban Land Use 2

## Saturday 16 July 2016

### **16/7 08:30 - 10:00 Plenary 2**

Session Chair: Lena Halounová, ISPRS  
Prague

Session Co-Chair: Christian Heipke, LUH

#### **08:30 Flexible Navigation for Mobile Robots Operating in the Real**

Cyrrill Stachniss, University of Bonn, Germany

#### **09:00 3D Reconstruction from Photographs**

Tomas Pajdla, Czech Technical University in Prague, Czech Republic

#### **09:30 Big Data in Photogrammetry and Remote Sensing**

Deren Li, Wuhan University, China

### **16/7 10:30 - 12:00 I/3 - Multi-Platform Multi-Sensor System Calibration 3**

Session Chair: Ayman Habib, Purdue University

Session Co-Chair: Boris Jutzi, KIT

#### **10:30 Matching aerial images to 3d building models based on context-based geometric hashing**

Gunho Sohn, York University, Canada

#### **10:48 Performance evaluation of different ground filtering algorithms for uav-based point clouds**

Cigdem Serifoglu, Karadeniz Technical University, Turkey

#### **11:06 Orientation of Oblique Airborne Image Sets - Experiences from the ISPRS/EuroSDR Benchmark on Multi-Platform Photogrammetry**

Markus Gerke, University of Twente, The Netherlands

#### **11:24 Multi Sensor and Platforms Setups for Various Airborne Applications**

Rudi Vasel, Aerial Surveys GmbH, Germany

#### **11:42 Co-registration Airborne LiDAR point cloud data and synchronous digital images using combined adjustment**

Yunsheng Zhang, Central South University, China

### **16/7 10:30 - 12:00 II/3 - Spatial Analysis and Data Mining 2**

Session Chair: Stefania Zourlidou, Leibniz University

Session Co-Chair: Luliang TANG, Wuhan University

#### **10:30 Application of dsm in obstacle clearance surveying of aerodrome**

Xin Qiao, Qingdao Geotechnical Investigation and Surveying Institute, China

#### **10:48 Wikipedia Entries as a Source of Car Navigation Landmarks**

Sagi Dalyot, The Technion, Israel

#### **11:06 Intersection detection based on qualitative spatial reasoning on stopping-point clusters**

Stefania Zourlidou, Leibniz University, Germany

#### **11:24 Crowdsourcing Big Trace data Filtering: A Partition-and-Filter Model**

Xue Yang, Wuhan University, China

#### **11:42 Towards adaptive high-resolution images retrieval schemes**

Assia Kourgli, USTHB, Algeria

### **16/7 10:30 - 12:00 III/3 - Image Sequence Analysis 2**

Session Chair: Michael Ying Yang, ITC - University of Twente

Session Co-Chair: Clément Mallet, IGN

#### **10:30 Accurate Optical Target Pose Determination for Applications in Aerial Photogrammetry**

Davide Antonio Cucci, École polytechnique fédérale de Lausanne, Switzerland

#### **10:48 Change detection via morphological comparative filters**

Yuri V. Vizilter, State Research Institute of Aviation Systems, Russian Federation

#### **11:06 Simultaneous detection and tracking of pedestrian from panoramic laser scanning data**

Wen Xiao, Newcastle University, UK

#### **11:24 GPS-Denied Geo-Localisation Using Visual Odometry**

Alper Yilmaz, The Ohio State University, USA



**11:42** A unified blending framework for panorama completion via graph cuts  
Kai Chen, Wuhan University, China

**16/7 10:30 - 12:00 IV/8 - Planetary Mapping and Spatial Databases 2**

Session Chair: Paul Schenk, Ipi

Session Co-Chair: Jonas Bostelmann, Leibniz Universität Hannover

**10:30** Korean lunar lander – concept study for landing-site selection for lunar resource exploration

Christian Wöhler, Technische Universität Dortmund, Germany

**10:48** Geopositioning precision analysis of multiple image triangulation using IRO NAC lunar images

Kaichang Di, Institute of Remote Sensing and Digital Earth, CAS, China

**11:06** Photogrammetric processing of apollo 15 metric camera oblique images

Kenneth Lee Edmundson, U.S. Geological Survey, USA

**11:24** Method of a planetary rover localization based on synthetic Lunokhod images

Natalia Kozlova, MIIGAiK MExLab, Russian Federation

**11:42** Estimate of DTM degradation due to image compression for the stereo camera of the Bepicolombo mission

Cristina Re, INAF, Italy

**16/7 10:30 - 12:00 V/4 - Terrestrial 3D Modelling: Algorithms and Methods 2**

Session Chair: Diego Gonzalez-Aguilera, University of Salamanca

Session Co-Chair: Takashi Fuse, University of Tokyo

**10:30** Exploring regularities for improving façade reconstruction from terrestrial point clouds

Kaixuan Zhou, TU Delft, The Netherlands

**10:48** Validation of point clouds segmentation algorithms through their application to several case studies for indoor building modelling

Hélène Macher, ICube Laboratory UMR 7357,

INSA Strasbourg, France

**11:06** Deriving 3D point clouds from terrestrial photographs - Comparison of different sensors and software

Helene Petschko, Friedrich Schiller University Jena, Germany

**11:24** Integrating Smartphone Images and Airborne Lidar Data for Complete Urban Building Modelling

Shenman Zhang, Wuhan University, China

**11:42** Combination of TLS point clouds and 3D data from Kinect v2 sensor to complete indoor models

Elise LACHAT, ICube Laboratory - INSA Strasbourg, France

**16/7 10:30 - 12:00 VII/2 - DEM Generation and Surface Deformation Monitoring from SAR Data + SpS 14 - IAG: Imaging Geodesy**

Session Chair: Uwe Soergel, TU Darmstadt

Session Co-Chair: Michele Crosetto, CTTC

**10:30** Monitoring of land subsidence in Ravenna municipality using integrated sar - gnss techniques: description and first results.

Giuseppe Artese, University of Calabria, Italy

**10:48** Monitoring Ground Subsidence in Areas Covered By Dense Vegetation Using TerraSAR-X Images: A Case Study of Hangzhou

Hong'an Wu, Chinese Academy of Surveying and Mapping, China

**11:06** Coseismic Deformation Field and Fault Slip Distribution of the 2015 Chile Mw8.3 Earthquake

Chunyan Qu, State Key Laboratory of Earthquake Dynamics, Institute of Geology, China

**11:24** Sentinel-1 InSAR processing of corner reflector information in the northern-Bohemian coal basin

Ivana Hlavacova, Czech Technical University in Prague, Czech Republic

**11:42** Precursory Slope Deformation Around Landslide Area Detected by InSAR Throughout Japan

Takayuki Nakano, Geospatial Information

Authority of Japan, Japan

## 16/7 10:30 - 12:00 VIII/8 - Land Cover and its Dynamics, Including Agricultural & Urban Land Use 1

Session Chair: Evgeny Panidi, Saint-Petersburg State University

Session Co-Chair: Kentaro Kuwata, the University of Tokyo

### 10:30 How Much Carbon is Store in Deserts? An Approach for Chilean Atacama Desert Using Landsat-8 Products

Hector Jaime Hernandez, Universidad de Chile, Chile

### 10:48 Urban Morphological Dynamics in Santiago (Chile): Proposing Sustainable Indicators From Remote Sensing

Hector Jaime Hernandez, Universidad de Chile, Chile

### 11:06 Examining Urban Expansion Using Multi-temporal Landsat Imagery: A Case Study Of The Montreal Census Metropolitan Area From 1975 to 2015, Canada

Lingfei Ma, Univeristy of Waterloo, Ontario, Canada

### 11:24 Comparison of Uncalibrated Rgbvi with Spectrometer-Based NDVI Derived from UAV Sensing Systems on Field Scale

Georg Bareth, University of Cologne, Geography, Germany

### 11:42 Multi-temporal analysis of WWII reconnaissance photos

Patrik Meixner, Primis spol. s r. o., Czech Republic

## 16/7 13:30 - 15:00 I/2 - LiDAR, SAR and Optical Sensors for Airborne and Spaceborne Platforms 4

Session Chair: Norbert Haala, University of Stuttgart

Session Co-Chair: Dorota Iwaszczuk, Technische Universität München

### 13:30 Simulation of full-waveform laser altimeter echo waveform

Yi Lv, Tongji University, China

### 13:48 Pairwise-SVM for On-Board Urban Road LiDAR Classification

Zhen Shu, Leador Spatial Information Technology Co., Ltd, China

### 14:06 Developing the stablilized mapping system for the gyrocopter - report from the first tests

Jakub Kolecki, ADRAM Ltd., Poland

### 14:24 Potential of Airborne Imaging Spectroscopy at CzechGlobe

Jan Hanuš, UVGZ AV ČR - CzechGlobe, Czech Republic

## 16/7 13:30 - 15:00 II/4 - Spatial Statistics and Uncertainty Modeling

Session Chair: Wenzhong John Shi, The Hong Kong Polytechnic University

Session Co-Chair: Huan Xie, Tongji University

### 13:30 A Contributor-Reputation Based Trust Degree Computation Model for Crowdsourcing Geographic Data

Xiaoguang Zhou, Central South University, China

### 13:48 Accuracy and spatial variability of GNSS surveying to landslides mapping in road inventories to semi-detailed scale: case in Colombia

Nixon Alexander Correa Muñoz, Universidad Nacional de Colombia, Colombia

### 14:06 Analysis and Validation of Grid DEM Generation Based on Gaussian Markov Random Field (GMRF)

Fernando J. Aguilar, University of Almeria, Spain

### 14:24 Validation and Upscaling of Soil Moisture Satellite Products in Romania

Ionut Sandric, Esri Romania; University of Bucharest, Romania

### 14:42 Evaluating the effects of reductions in lidar data on the visual and statistical characteristics of the created digital elevation models

Fahmy Fahiem Asal, Menoufia University, Egypt

## 16/7 13:30 - 15:00 II/ThS 12 - Location-based Social Media Data

Session Chair: Marguerite Madden, University of Georgia

Session Co-Chair: Mingshu Wang, University of Georgia

**13:30** A three-step spatial-temporal-  
semantics clustering algorithm for human  
activity pattern analysis

Wei Huang, Ryerson University, Toronto,  
Canada

**13:48** Using crowdsourced data (twitter  
& facebook) to delineate the origin and  
destination of commuters of the gautrain  
public transit system in south africa  
Themban Moyo, University of Johannesburg,  
South Africa

**14:06** NASA Web World Wind:  
Multidimensional Virtual Globe for Geo Big  
Data Visualization

Gabriele Prestifilippo, Politecnico di Milano,  
Italy

**14:24** Using geo-targeted social media data  
to detect outdoor air pollution

Wei Jiang, Wuhan University, China

**16/7 13:30 - 15:00 IV/5 - Web and Cloud  
Based Geospatial Services and  
Applications 2 + SpS 6 - ICA: LBS and  
ubiquitous cartography**

Session Chair: Maria Antonia Brovelli,  
Politecnico di Milano

Session Co-Chair: Bert Veenendaal, Curtin  
University

**13:30** Designing and modelling coast  
management gis for bosphorus

Mustafa Umit Gumusay, Yildiz Technical  
University, Turkey;

**13:48** Vega-Constellation Tools to Analyze  
Hyperspectral Images

Victor Petrovich Savorskiy, Kotel'nikov IRE  
RAS, Russian Federation

**14:06** Defining earth data batch processing  
tasks by means of a flexible workflow  
description language

Constantin-Ioan Nandra, Technical University  
of Cluj-Napoca, Romania

**14:24** Atlas basemaps in Web 2.0 epoch

Viktor Chabaniuk, National Academy of  
Sciences of Ukraine, Ukraine

**16/7 13:30 - 15:00 IV/II - Computing Op-  
timization for Spatial Databases**

**and Location based Services + IV/  
II/VIII - Global Land Cover Mapping  
and Services + IV/6 - Sensor Web and  
Internet of Things 1**

Session Chair: Umit Isikdag, Mimar Sinan Fine  
Arts University

Session Co-Chair: Patrik Meixner, Primis spol.  
s r. o.

**13:30** Tiling and stitching raster data, GIS  
data processing in distributed computing  
environment

Angéla Olasz, Institute of Geodesy,  
Cartography and Remote Sensing (FÖMI),  
Hungary

**13:48** OpenStreetMap Data as Source for  
Built-up and Urban Areas on Global Scale

Thomas Brinkhoff, Jade University Oldenburg,  
Germany

**14:06** Integration of Geo-Sensor Feeds and  
Event Consumer Services for Real-Time  
Representation of IoT Nodes

Umit Isikdag, Mimar Sinan Fine Arts University,  
Turkey

**14:42** Design and implement an  
interoperable Internet of Things application  
based on an extended OGC SensorThings  
API standard

Chih-Yuan Huang, National Central University,  
Taiwan

**16/7 13:30 - 15:00 V/SpS 1 - CIPA: Geospa-  
tial Technology for Cultural Heritage**

Session Chair: Andreas Georgopoulos, ELKE  
NTUA

Session Co-Chair: Stratos Stylianidis,  
Geolmaging Ltd

**13:30** 3D Image Based Geometric  
Documentation of the Tower of Winds  
Magdalini Tryfona, ELKE NTUA, Greece

**13:48** Recording and modelling of  
monuments' interior space using range and  
optical sensors

Charalampos Georgiadis, Artistotle University  
of Thessaloniki, Greece

**14:06** The Florence Baptistery: 3-D survey as  
a knowledge tool for historical and structural  
investigations



Grazia Tucci, University of Florence, Italy

**14:24** Technical assistance for the conservation of built heritage at Bagan, Myanmar

Davide Mezzino, Carleton University, Canada

**14:42** The CIPA Database for Saving the Heritage of Syria

Minna Angelina Silver, University of Oulu, Finland

**16/7 13:30 - 15:00 VII/ThS 6 - Persistent Scatterer Interferometry**

Session Chair: Michele Crosetto, CTTC

Session Co-Chair: Uwe Soergel, TU Darmstadt

**13:30** Persistent Scatterer Interferometry Using Sentinel-1 Data

Michele Crosetto, CTTC, Geomatics Division Spain

**13:48** Centimeter Cosmo-Skymed Range Measurements for Monitoring Ground Displacements

Paola Capaldo, University of Rome "La Sapienza", Italy

**14:06** Change detection based on persistent scatterer interferometry - a new method of monitoring building changes

Chia-Hsiang Yang, Technical University of Darmstadt, Germany

**16/7 13:30 - 15:00 VIII/6 - Cryosphere 1**

Session Chair: Josefino Comiso, NASA

Session Co-Chair: Kohei Cho, Tokai University

**13:30** Mass balance changes and ice dynamics of Greenland and Antarctic ice sheets from laser altimetry

Beata M. Csatho, University at Buffalo, USA

**13:48** Glacier volume change estimation using time series of improved ASTER DEMs

Luc Girod, University of Oslo, Norway

**14:06** Fusion of laser altimetry data with DEMs derived from stereo imaging systems

Toni F. Schenk, University at Buffalo, USA

**14:24** A Novel Method for Estimation of Glacier Surface Motion in 1960s from ARGON KH-5 Optical Imagery

Rongxing Li, Tongji University, China

**14:42** Optical flow applied to time-lapse image series to estimate glacier motion in the southern Patagonia ice field

Maria Gabriela Lenzano, National Cuyo Universit, Argentina

**16/7 15:00 - 16:30 Interactive session**

(I/1, I/3, II/4, III/2, IV/5, IV/II, V/4, VII/2, VIII/6, ThS4, ThS7, ThS9, ThS12, SpS1)

**I/1 - Standardization of Airborne Platform Interfaces**

**Java-Library for the Access, Storage and Editing of Calibration Metadata of Optical Sensors**

*Wolfgang Kresse, Politechnika Koszalińska, Poland*

**I/3 - Multi-Platform Multi-Sensor System Calibration**

**Critical Assessment of Correction Methods for Fisheye Lens Distortion**

*Yangyang Liu, WuHan University, China*

**The outdoor rapid calibration technique and realization of non-metric digital camera based on the method of multi-image DLT and resection**

*Qiang Zhang, Information Engineering University, China*

**National Guidelines for Digital Camera Systems Certification**

*Yaron A Felus, Survey of Israel, Israel*

**Performance assessment and geometric calibration of Resourcesat-2**

*Radhadevi Pullur Variam, Advanced data Processing Research Institute, India*

**Commercial Off the Shelf Ground Control Supports Calibration and Conflation From Ground to Space Based Sensors**

*Mariana Danielova, AccuEarth s.r.o., Czech Republic*

**Evaluation Of Main CEOS Pseudo-Invariant Calibration Sites Using MODIS, MISR And GlobAlbedo Products**

*Said Kharbouche, Mullard Space Science Laboratory, United Kingdom*

**II/4 - Spatial Statistics and Uncertainty Modeling**

**Estimating sea ice parameters from multi-look SAR images using first- and second-order variograms**

*Xiaojuan Wang, Liaoning Technical University, China*

**Study on modeling and visualizing the positional uncertainty of remote sensing image**

*Weili Jiao, Chinese Academy of Sciences, China*

**Modeling urban dynamics using random forest: Implementing ROC and TOC for model evaluation**

*Mahmoud Reza Delavar, University of Tehran, Iran*

**Will it blend? Visualization and accuracy evaluation of high-resolution fuzzy vegetation maps**

*András Zlinszky, Hungarian Academy of Sciences, Hungary*

**Non Linear Optimization Applied to Angle-Of-Arrival Satellite Based Geo-Localization for Biased and Time-Drifting Sensors**

*Andrew Terzuoli, IEEE, USA*

**A modified genetic algorithm for finding fuzzy shortest paths in uncertain networks**

*Mahmoud Reza Delavar, University of Tehran, Iran*

**III/2 - Point Cloud Processing**

**Uncertainty propagation for terrestrial mobile laser scanner**

*Miloud Mezian, Universite Paris-Est, France*

**Digital terrain from a two-step segmentation and outlier-based algorithm**

*Kassel Liam Hingee, University of Western Australia, Australia*

**Point cloud refinement with a target-free intrinsic calibration of a mobile multi-beam LIDAR system**

*Houssem Noura, Mines ParisTech, France*

**Multispectral airborne laser scanning for automated map updating**

*Leena Matikainen, Finnish Geospatial Research Institute FGI, Finland*

**The igmulus urban showcase: automatic tree classification and identification in huge mobile mapping point clouds**

*Roderik Lindenbergh, TU Delft, the Netherlands*

**A Fast and Flexible Method for Meta-Map Building for ICP Based SLAM**

*Kristian Morin, Leica Geosystems, Canada*

**Automated mosaicking of multiple 3d point clouds generated from a depth camera**

*Hangyeol Kim, Inha University, Korea*

**Evaluating Morphological Changes along a Dike Landside Slope by 4-D High Resolution Terrestrial Laser Scanning**

*Roderik Lindenbergh, Delft University of Technology, the Netherlands*

**Evaluation of methods for coregistration and fusion of RPAS-based 3D point clouds and thermal infrared images**

*Ludwig Hoegner, Technical University of Munich, Germany*

**Evaluation of wavelet and non-local mean denoised terrestrial laser scanning data for small-scale joint roughness estimation**

*Maja Bitenc, Graz University of Technology, Austria*

**Towards automatic single-sensor mapping by multispectral airborne laser scanning**

*Eero Ahokas, Finnish Geospatial Research Institute FGI, Finland*

**Urban road detection in airborne laser scanning point cloud using random forest algorithm**

*Andrzej Borkowski, Wroclaw University of Environmental and Life Sciences, Poland*

**A min-cut based filter for airborne lidar data**

*Serkan Ural, Purdue University, U.S.A.; Hacettepe University, Turkey*

**Perspective intensity images for co-registration of terrestrial laser scanner and digital camera**

*Yubin Liang, Tianjin Normal University, China*

**Building facade documentation using laser scanning and photogrammetry and data implementation into BIM**

*Martina Faltýnová, Czech Technical University in Prague, Czech Republic*

**Using mobile laser scanning data for features extraction of high accuracy driving maps**

*Yuan Liu, Wuhan University, China*

**A Weighted Closed-form Solution for RGB-D Data Registration**

*Kaue de Moraes Vestena, Federal University of Parana - UFPR, Brazil*

**Tensor based object-oriented classification for Airborne LiDAR data**

*Nan Li, Tongji University, China*

**An approach to automatic detection and hazard risk assessment of large protruding rocks in densely forested hilly region**

*Subas Chhatkuli, Pasco Corporation, Japan*

**Change Detection of Mobile LiDAR Data Using Cloud Computing**

*Kun Liu, University College London, United Kingdom*

**Road-scene tree separation from mobile laser scanning data**

*Haiyan Guan, Nanjing University of Information Science & Technology, China*

**First Prismatic Building Model Reconstruction from Tomosar Point Clouds**

*Yao Sun, Technical University of Munich (TUM), Germany; Wuhan University, China*

**The use of computer vision algorithms in the process of automatic terrestrial laser scanning data registration**

*Jakub Markiewicz, Warsaw University of Technology, Poland*

**An energy-based approach for detection and characterization of subtle entities within terrestrial laser scanning point-**

**clouds**

*Reuma Arav, Technion - Israel Institute of Technology, Israel*

**Classification of Lidar data for generating a highly precise roadway map**

*Jihee Jeong, University of Seoul, Korea*

**DTM Generation from Photogrammetric Point Clouds with a Partial Use of an Existing Lower Resolution DTM**

*Misganu Debella-Gilo, Norwegian Institute for Bioeconomy Research, Norway*

**Digital terrain models from mobile laser scanning data in Moravian Karst**

*Nataliya Tyagur, Brno University of Technology, Czech Republic*

**Automatic extraction of building outlines from point cloud generated from high resolution aerial images**

*Yandong Wang, EagleView technology Corporation, USA*

**Forest stand segmentation using airborne lidar data and very high resolution multispectral imagery**

*Clément Dechesne, IGN - Laboratoire MATIS, France*

**Extension of RCC Topological Relations for 3D Complex Objects Components Extracted from 3D LiDAR Point Clouds**

*Xu-Feng XING, Laval University, Canada*

**Individual Tree of Urban Forest Extraction from Very High Density LiDAR Data**

*Mehran Satari Abrovi, University of Isfahan, Iran*

**Multiparameter correction intensity of terrestrial laser scanning data as an input for rock surface modelling**

*Václav Paleček, Masaryk University, Czech Republic*

**Fast and robust stem reconstruction in complex environments using terrestrial laser scanning**

*Di Wang, Vienna University of Technology, Austria*

**Automatic 3D extraction of buildings, vegetation and roads from lidar data**

*Adelmounim Bellakaout, Institut*



*Agronomique et Vétérinaire Hassan II,  
Morocco*

## **Point Cloud Oriented Shoulder Line Extraction in Loess Hilly Area**

*Min Li, Nanjing Normal University, China;  
Jiangsu Center for Collaborative Innovation  
in Geographical Information Resource  
Development and Application, China*

## **Automatic Road Extraction Based On Multiple Features from LiDAR Data**

*Yijing Li, the School of Civil Engineering and  
Architecture in Nanchang University, China*

## **The Performance of Semi-Automatic DTM from Point Cloud Image Matching Compared with DTM from LIDAR**

*Aji Rahmayudi, Badan Informasi Geospasial,  
Indonesia*

## **Convolutional neural network based DEM super resolution**

*Wenguang Hou, Huazhong University of  
Science and Technology, China*

## **Detection of geometric keypoints and its application to point cloud coarse registration**

*Martín Rodrigo Bueno Esposito, University of  
Vigo, Spain*

## **Dubai 3D textured DSM using high resolu- tion vertical and oblique airborne imagery** *Abd Allateef Ziad Ahmad, Dubai Municipality, United Arab Emirates*

## **Scan profiles based method for segmentation of mobile laser scanning point clouds**

*Hoang Long Nguyen, Curtin University,  
Australia*

## **Land covers classification from full- waveform lidar data based on support vector machines**

*Mei Zhou, Chinese Academy of Sciences,  
China*

## **IV/5 - Web and Cloud Based Geospatial Services and Applications**

### **Traffic Sign Inventory from Google Street View images**

*Victor J. D. Tsai, National Chung Hsing*

*University, Taiwan, China*

### **Use and optimisation of paid crowdsourcing for the collection of geodata**

*Volker Walter, University of Stuttgart,  
Germany*

### **Optimizing cloud based image storage, dissemination and processing**

*Peter Becker, Esri, USA*

### **Eras of web mapping developments: past, present and future**

*Bert Veenendaal, Curtin University, Australia*

## **IV/II - Computing Optimization for Spatial Databases and Location based Services**

### **Providing R-tree support for mongoDB database**

*Longgang Xiang, LIESMARS, China*

### **The design of a high performance earth image and raster data management and processing platform**

*Qingyun {Jeffrey} Xie, Oracle Corporation,  
USA*

### **Creation of a Web Map and Mobile Application based on a Printed Book**

*Vladimír Holubec, Czech technical university  
in Prague, Czech Republic*

## **V/4 - Terrestrial 3D Modelling: Algorithms and Methods**

### **A fast and robust algorithm for road edges extraction from LIDAR data**

*Kaijin Qiu, Leader Spatial Information  
Technology Corporation, China*

### **The feasibility of 3D point cloud generation from Smartphones**

*Naif Muidh Alsubaie, University of Calgary,  
Canada*

### **Coarse point cloud registration by EGI matching of voxel clusters**

*Jinhu Wang, Delft University of Technology,  
the Netherlands*

### **Kinect V2 and RGB Stereo Cameras Integration for Depth Map Enhancement**

*Roberta Ravanelli, University of Rome "La  
Sapienza", Italy*

**Drawing for traffic marking using  
bidirectional gradient-based detection  
with MMS LiDAR intensity**

*Genki Takahashi, Kokusai Kogyo Co., Ltd.,  
Japan*

**Tree stem reconstruction using vertical  
fisheye images: a preliminary study**

*Adilson Berveglieri, São Paulo State  
University - UNESP, Brazil*

**Multi-target Detection from Full-waveform  
Airborne Laser Scanner Using PHD Filter**

*Wataru Nakanishi, University of Tokyo, Japan*

**An automatic method for geometric  
segmentation of masonry arch bridges for  
structural engineering purposes**

*Belén Riveiro, University of Vigo, Spain*

**Incorporation of unreliable information  
into photogrammetric reconstruction for  
recovery of scale and geolocation using  
non-parametric belief propagation**

*Joshua Stephen Hollick, Curtin University,  
Australia*

**Development of image selection method  
using graph cuts**

*Takashi Fuse, University of Tokyo, Japan*

**VII/2 - DEM Generation and Surface De-  
formation Monitoring from SAR Data**

**A method for the extraction of long-term  
deformation characteristics of long-span  
high-speed railway bridges using high-  
resolution SAR images**

*Hongguo Jia, Southwest Jiaotong University,  
China*

**Land Subsidence Monitoring Using PS-  
InSAR Technique for L-Band SAR Data**

*Shailaja Thapa, Indian Space Research  
Organization, India*

**Semi-Automatic DTM from DSM Radar  
Data to Accelerate Topographic Map  
Production**

*Aldino Rizaldy, Badan Informasi Geospasial  
(Geospatial Information Agency), Indonesia*

**Baseline Estimation Algorithm with Block  
Adjustment for Multi-Pass Dual-Antenna  
InSAR**

*Guowang Jin, Zhengzhou Institute of  
Surveying and Mapping, China*

**Ground deformation monitoring Qingdao  
coastal areas by time-series TerraSAR-X  
images**

*Anye Hou, Qingdao Geotechnical  
Investigation and Surveying Research  
Institute; Engineering Research Center of  
Shandong For Ocean Geographic Information  
Integration and Application, China*

**VIII/6 - Cryosphere**

**Forecasting Antarctic sea ice  
concentrations using results of temporal  
mixture analysis**

*Junhwa Chi, Korea Polar Research Institute,  
Korea*

**Change analysis of Antarctic ice shelves  
based on multiple remote sensing  
products**

*Yixiang Tian, Tongji University, China*

**Antarctic ice sheet surface mass balance  
estimates from 2003 to 2015 using ICESat  
and CryoSat-2 data**

*Huan Xie, Tongji University, China*

**Comparison of digital surface models  
for snow depth mapping with drone and  
aerial cameras**

*Ruedi Boesch, Swiss Federal Institute for  
Forest, Snow and Landscape Research  
WSL, Switzerland*

**Study on the retrieval of snow depth from  
FY3B/MWRI in the Arctic**

*Lele Li, Ocean University of China, China*

**Long-term monitoring of glacier change  
at Gössnitzkees (Austria) using terrestrial  
photogrammetry**

*Viktor Kaufmann, Graz University of  
Technology, Austria*

**Novel Snow Depth Retrieval Method  
Using Time Series SSM/I Passive  
Microwave Imagery**

*Mahdi Hasanlou, University of Tehran, Iran*

**A multi-temporal approach for detecting  
snow cover area using geostationary  
imagery data**

*Hwa-Seon Lee, Inha University, Korea*

#### ThS 4 - TanDEM-X

**Wetland mapping with SAR/Quadpol data acquired during TanDEM-X Science Phase**

*Magdalena Mleczko, University of Warmia and Mazury in Olsztyn, Poland*

#### ThS 7 - Information extraction from SAR imagery

**A combined correcting method about GB-SAR rail determination error and atmospheric effects**

*Junhuan Peng, China University of Geosciences, China*

#### ThS 9 - In-door and out-door seamless location and navigation

**The design of worker's behavior analysis method in workplace using indoor positioning technology**

*Kenichi Tabata, Kokusai Kogyo Co., Ltd, Japan*

#### ThS 12 - Location-based Social Media Data

**A method for studying the development pattern of urban commercial service facilities based on customer reviews from social media**

*Yandong Wang, Wuhan University, China*

**Tweets and Facebook posts, the novelty techniques in the creation of origin-destination models.**

*Hope Koketsa Malema, University of Johannesburg, South Africa*

**Using social media for disaster emergency management**

*Teng Wang, Wuhan University, China*

**Geography matters in online hotel reviews**

*Mingshu Wang, University of Georgia, USA*

**Spatial-Temporal analysis of social media data related to Nepal Earthquake 2015**

*Laxmi Thapa, Ministry of Land Reform and Management, Nepal*

#### SpS 1 - CIPA: Geospatial Technology for Cultural Heritage

**3D Survey and Augmented Reality for Cultural Heritage. The Case Study of Aurelian Wall at Castra Praetoria in Rome.**  
*Mauro Saccone, Università degli studi Roma Tre, Italy*

**Three dimensional reconstruction of large cultural heritage buildings from UAV video and TLS data**

*Lixin Wu, China University of Mining and Technology, China*

**3D visualization for virtual museum development**

*Margarita Skamantzari, NTUA, Greece*

#### **Rescheduled interactive presentations**

**Detection of barchan dunes on high resolution satellite images**

*Amine Mohammed Azzaoui, Université Mohammed V-Agdal, Morocco*

**Quality Test Various Existing DEM in Indonesia toward 10 meter National DEM**

*Fahmi Amhar, Geospatial Information Agency of Indonesia (BIG), Indonesia*

**A random forests approach for woody vegetation cover monitoring with Landsat data**

*Elias Symeonakis, Manchester Metropolitan University, United Kingdom*

#### **16/7 16:30 - 18:00 I/4 - Geometric and Radiometric Modeling of Optical Airborne and Spaceborne Sensors 2**

**Session Chair:** Daniela Poli, Terra Messflug  
**Session Co-Chair:** Thomas Krauss, DLR

**16:30 Refined satellite image orientation in the free open-source photogrammetric tools Apero/MicMac**

*Ewelina Rupnik, Ecole Nationale des Sciences Géographiques, Institut de Physique du Globe de Paris, France*

**16:48 RPC stereo processor (RSP) – a software package for digital surface model and orthophoto generation from satellite stereo imagery**

*Rongjun Qin, The Ohio State University, USA*



## **17:06 Analysis and correction of systematic height model errors**

Karsten Jacobsen, Leibniz University  
Hannover, Germany

## **17:24 Absolute Radiometric Calibration of the Göktürk-2 Satellite Sensor Using Tuz Gölü (Landnet Site) from NDVI Perspective**

Ufuk Sakarya, TÜBTAK UZAY, Turkey

## **16/7 16:30 - 18:00 III/2 - Point Cloud Processing 2**

Session Chair: Florent Lafarge, INRIA

Session Co-Chair: Martin Weinmann,  
Karlsruhe Institute of Technology (KIT)

## **16:30 Classification of LiDAR Data with Point Based Classification Methods**

Naci Yastikli, Yildiz Technical University, Turkey

## **16:48 Pairwise linkage for point cloud segmentation**

Xiaohu Lu, Wuhan University, China

## **17:06 Automatic extraction of DTM from low resolution DSM by two-steps semi-global filtering**

Yanfeng Zhang, Wuhan University, China

## **17:24 Urban tree classification using full-waveform Airborne Laser Scanning**

Zsófia Koma, Eötvös Loránd University,  
Hungary

## **17:42 Correction and Densification of UAS-Based Photogrammetric Thermal Point Cloud**

Ozgun Akcay, Canakkale Onsekiz Mart  
University, Turkey

## **16/7 16:30 - 18:00 IV/8 - Planetary Mapping and Spatial Databases 3**

Session Chair: Kaichang Di, Chinese  
Academy of Sciences

Session Co-Chair: Emerson Jacob Speyerer,  
Arizona State University

## **16:30 SAfS for pixel-level DEM generation from monocular images constrained by low-resolution DEM**

Bo Wu, The Hong Kong Polytechnic  
University, China

## **16:48 The effect of illumination on stereo DTM quality: Simulations in support of**

## **Europa exploration**

Randolph Kirk, U.S. Geological Survey,  
Astrogeology Science Center, USA

## **17:06 Refinement of stereo image analysis using photometric shape recovery as an alternative to bundle adjustment**

Arne Grumpe, TU Dortmund, Germany

## **17:24 Comparison and co-registration of DEMs generated from HiRISE and CTX images**

Yiran Wang, The Hong Kong Polytechnic  
University, China

## **17:42 Global bundle adjustment with variable orientation point distance for precise Mars Express orbit reconstruction**

Jonas Bostelmann, Leibniz Universität  
Hannover, Germany

## **16/7 16:30 - 18:00 IV/ThS 9 - In-door and out-door seamless location and navigation**

Session Chair: George Sithole, University of  
Cape Town

Session Co-Chair: Sisi Zlatanova, Delft  
University of Technology

## **16:30 Floor identification with commercial smartphones in WiFi -based Indoor Localization System**

Mengyun Liu, Wuhan University, China

## **16:48 Laser-Based SLAM with Efficient Occupancy Likelihood Map Learning for Dynamic Indoor Scenes**

Li Li, Wuhan University, China

## **17:06 Extension and evaluation of the AGAST feature detector**

Hongmou Zhang, German Aerospace Center,  
Germany

## **17:24 Private Graphs - Access rights on graphs for seamless navigation**

Wolfgang Dörner, Deggendorf Institute of  
Technology, Germany

## **17:42 A Review of Recent Research in Indoor Modelling & Mapping**

Mehmet Gunduz, Yildiz Technical University,  
Turkey

**16/7 16:30 - 18:00 V/3 - Terrestrial 3D Imaging and Sensors 2**

Session Chair: Roderik Lindenbergh, TU Delft  
Session Co-Chair: Zhizhong Kang, China University of Geosciences

**16:30 Motorized panoramic camera mount – Calibration and image capture**  
Heikki Juhani Kauhanen, Aalto University, Finland

**16:48 Enhancement of stereo imagery by artificial texture projection generated using a lidar**  
Joshua Veitch-Michaelis, University College London, United Kingdom

**17:06 Integration of Kinect and Low-Cost GNSS for Outdoor Navigation**  
Diana Pagliari, Politecnico di Milano, Italy

**17:24 Development and evaluation of simple measurement system using the oblique photo and DEM**  
Hideki Nonaka, Asia Air Survey Co., Ltd., Japan

**17:42 Calibration of the sr4500 time-of-flight camera for outdoor mobile surveying applications: a case study**  
Christophe Heinkelé, Cerema, France

**16/7 16:30 - 18:00 VII/ThS 7 - Information extraction from SAR imagery**

Session Chair: Mattia Crespi, University of Rome La Sapienza  
Session Co-Chair: Uwe Soergel, TU Darmstadt

**16:30 Improved model-based polarimetric decomposition using the polinsar similarity parameter**  
Houda Latrache, University of Sciences and Technology Houari Boumediene (USTHB), Algeria

**16:48 Detection of multipath pixels in SAR images by statistic methods**  
Jingwen Zhao, Tongji University, The Hong Kong Polytechnic University, China

**17:06 SAR Application**  
Min-Gee Hong, Kookmin University, Korea

**17:24 Polarimetric signatures identification**

for different features in Radarsat-2 PolSAR image: a case study of Halayib area, Egypt  
Ayman Nasr Hamed Nasr, National Authority for Remote Sensing and Space Sciences (NARSS), Egypt

**17:42 Evaluation of relative geometric accuracy of TerraSAR-X by pixel matching methodology**  
Takashi Nonaka, Nihon University, Japan

**16/7 16:30 - 18:00 VIII/6 - Cryosphere 2**

Session Chair: Beata Maria Csatho, University at Buffalo  
Session Co-Chair: Luc Girod, University of Oslo

**16:30 Global changes in the sea ice cover and associated surface temperature changes**  
Josefino Comiso, NASA, USA

**17:06 Thin ice area extraction in the Sea of Okhotsk from GCOM-W1/AMSR2 Data**  
Kohei Cho, Tokai University, Japan

**17:24 Remotely-sensed glacier change estimation: a case study at Lindblad Cove, Antarctic Peninsula**  
Karolina D. Fieber, Newcastle University, United Kingdom

**17:42 Recognition of drainage tunnels during glacier lake outburst events from terrestrial image sequences**  
Ellen Schwalbe, Technische Universität Dresden, Germany

**16/7 16:30 - 18:00 VIII/8 - Land Cover and its Dynamics, Including Agricultural & Urban Land Use 2**

Session Chair: Georg Bareth, University of Cologne

**16:30 Combined analysis of Sentinel-1 and RapidEye data for improved crop type classification: an early season approach for rapeseed and cereals**  
Ulrike Lussem, University of Cologne, Germany

**16:48 Mapping of the land cover spatiotemporal characteristics in Northern Russia caused by climate change**  
Evgeny Panidi, Saint-Petersburg State

University, Russia

**17:06** Characterization and spectral monitoring of coffee lands in Brazil

Helena Maria Ramos Alves, EMBRAPA, Brazil

**17:24** Estimating corn yield in the United States with MODIS EVI and machine learning methods

Kentaro Kuwata, University of Tokyo, Japan

**17:42** Assessment of Classification Accuracies of Sentinel-2 and Landsat-8 Data for Land Cover / Use Mapping

Raziye Hale Topaloglu, Istanbul Technical University, Turkey.

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brighter with bigger investments planned in the application of newer technologies.

- The 2020 ISPRS Congress in Dubai will also give the participants a chance to experience the traditional Middle Eastern culture with a delectable mix of some of the most advanced and ultra-modern architectural creations on the planet





PROGRAM XXIII ISPRS  
SUNDAY 17 JULY



Sunday, 17 July, 2016

TIME	LOCATION	SESSION
08:30 - 10:00	Small HallI	I/Vb - Unmanned Vehicle Systems (UVS): Sensors and Applications 6
	Meeting Hall I A	II/3 - Spatial Analysis and Data Mining 3 + ICWG
	Club B	II/ThS 13 - Linked Geospatial Data + ICWG II/IV - Semantic Interoperability and Ontology for Geospatial Information
	Club H	III/1 - Orientation and Surface Reconstruction 3
	Club C	IV/SpS 18 - Advancing Geospatial Research into Standards: The ISPRS and OGC Coordination
	Club A	V/2 - Cultural Heritage Data Acquisition and Processing: Recent survey methods for CH documentation
	Meeting Hall I B	VII/4 - Methods for Image Classification 6
	Club D	VIII/7 - Forestry, Natural Ecosystems & Biodiversity 1
	Club E	Youth Forum 1
10:30 - 12:00	Small HallI	I/Vb - Unmanned Vehicle Systems (UVS): Sensors and Applications 7
	Club B	II/7 - Intelligent Spatial Decision Support
	Club A	III/I - Sensor Modeling for Integrated Orientation and Navigation
	Club D	IV/ThS 8 - Recent mapping of small planetary satellites, asteroids and comets
	Meeting Hall I A	V/1 - Vision Metrology 3
	Club C	VII/4 - Methods for Image Classification 7
	Meeting Hall I B	VIII/7 - Forestry, Natural Ecosystems & Biodiversity 2
	Club E	Youth Forum 2
13:30 - 15:00	Club H	I/4 - Geometric and Radiometric Modeling of Optical Airborne and Spaceborne Sensors 3
	Club B	II/8 - Mobility: Tracking, Analysis and Communication



	Club A	III/1 - Orientation and Surface Reconstruction 4 + III/4 - 3D Scene Analysis 3
	Small Hall I	V/2 - Cultural Heritage Data Acquisition and Processing: UAV and Photogrammetry for CH survey
	Club C	VII/5 - Methods for Change Detection and Process Modelling 2
	Club D	VII/ThS 3 - Sentinel-I Radar
	Meeting Hall I A	VIII/7 - Forestry, Natural Ecosystems & Biodiversity 3 + ThS 10 - Spatial ecology and ecosystem services mapping using Essential Biodiversity Variables (EBVs)
	Meeting Hall I B	VIII/8 - Land Cover and its Dynamics, Including Agricultural & Urban Land Use 3
	Club E	Youth Forum 3
15:00 - 16:30	Foyer 3rd Floor	Interactive session (II/3, II/7, II/8, III/I, VII/4, VIII/8, ThS1, ThS3, ThS13, ThS14, YF)
16:30 - 18:00	Club H	I/4 - Geometric and Radiometric Modeling of Optical Airborne and Spaceborne Sensors 4
	Club B	II/ThS 14 - Recent Developments in Open Data
	Club C	IV/SpS 4 - ICA: Image maps- theory, methods, standards
	Club A	V/3 - Terrestrial 3D Imaging and Sensors 3
	Club D	VII/5 - Methods for Change Detection and Process Modelling 3
	Meeting Hall I A	VIII/7 - Forestry, Natural Ecosystems & Biodiversity 4
	Meeting Hall I B	VIII/8 - Land Cover and its Dynamics, Including Agricultural & Urban Land Use 4
	Club E	VIII/9 - Coastal and Ocean Applications 1



## Sunday 17 July 2016

### 17/7 08:30 - 10:00 I/Vb - Unmanned Vehicle Systems (UVS): Sensors and Applications 6

Session Chair: Francesco Nex, University of Twente - ITC Faculty

Session Co-Chair: Heidi Hastedt, Jade university of Applied Sciences

**08:30** Modelling steep surfaces by various configurations of nadir and oblique photogrammetry

Vittorio Casella, University of Pavia, Italy

**08:48** An integrative object-based image analysis workflow for UAV images

Huai Yu, Wuhan University, China

**09:06** Forest Canopies and Open Area Effects on Snow Accumulation from Unmanned Aerial Vehicle (UAV) Photogrammetry and Ground Measurements, Sumava National Park, Czech Republic

Theodora Lendzioch, Charles University, Czech Republic

**09:24** Random forest and objected-based classification for forest pest extraction from uav aerial imagery

Yi Yuan, Wuhan University, China

### 17/7 08:30 - 10:00 II/3 - Spatial Analysis and Data Mining 3 + ICWG

Session Chair: Yaolin Liu, Wuhan University

Session Co-Chair: Wenbo Chen, Keio University, Nature&Science Consulting

**08:30** Development of MATCHED (Migratory Analytical Time Change Easy Detection) method for satellite-tracked migratory birds

Wenbo Chen, Nature&Science Consulting; Keio University, Japan

**08:48** Mining co-location patterns from spatial data

Da-Quan Tang, National University of Defense Technology, China

**09:06** Researches on visual analysis methods on terrorism events

Wenyue Guo, Institute of Surveying and Mapping, China

**09:24** How travel demand affects detection of non-recurrent traffic congestion on urban road networks

Berk Anbarolu, Hacettepe University, Turkey

### 17/7 08:30 - 10:00 II/ThS 13 - Linked Geospatial Data + ICWG II/IV - Semantic Interoperability and Ontology for Geospatial Information

Session Chair: Mir Abolfazl Mostafavi, Université Laval

**08:30** Providing geographic datasets as linked data in sdi

Eero Hietanen, Finnish Geospatial Research Institute (FGI), Finland

**08:48** A new ontological perspective for integration of social and physical environments: disability and rehabilitation context

Mir Abolfazl Mostafavi, Laval university, Canada

**09:06** Semantic location extraction from crowdsourced data

Saman Koswatte, University of Southern Queensland, Australia

### 17/7 08:30 - 10:00 III/1- Orientation and Surface Reconstruction 3

Session Chair: Andreas Kuhn, Bundeswehr University Munich

Session Co-Chair: Ronny Haensch, Technische Universität Berlin

**08:30** A Median-Based Depthmap Fusion Strategy for the Generation of Oriented Points

Mathias Rothermel, nFrames, Germany

**08:48** Revisiting Intrinsic Curves for Efficient Dense Stereo Matching

Mozhdeh Shahbazi, Université de Sherbrooke, Canada

**09:06** Towards complete, geo-referenced 3D models from crowd-sourced amateur images

Wilfried Hartmann, ETH Zürich, Switzerland

**09:24** A new paradigm for matching UAV- and aerial images

Tobias Koch, Technische Universität München, Germany

**09:42 MLPnP - A Real-Time Maximum Likelihood Solution to the Perspective-n-Point Problem**

Steffen Urban, Karlsruhe Institute of Technology, Germany

**17/7 08:30 - 10:00 IV/SpS 18 - Advancing Geospatial Research into Standards: The ISPRS and OGC Coordination**

Session Chair: George Percivall, Open Geospatial Consortium

Session Co-Chair: Songnian Li, Ryerson University

**08:30 Standards-Based Services for Big Spatio-Temporal Data**

Peter Baumann, Jacobs University, Germany

**09:06 Advancements in open geospatial standards for photogrammetry and remote sensing from OGC**

George Percivall, Open Geospatial Consortium (OGC), United States of America

**09:24 IndoorGML - a standard for indoor spatial modeling**

Ki Joune Li, Pusan National University, Korea

**17/7 08:30 - 10:00 V/2 - Cultural Heritage Data Acquisition and Processing: Recent survey methods for CH documentation**

Session Chair: Tania LANDES, INSA de Strasbourg

Session Co-Chair: Grazia Tucci, University of Florence

**08:30 Integrated Survey for Architectural Restoration: A Methodological Comparison of Two Case Studies**

Gianfranco Forlani, University of Parma, Italy

**08:48 Recording and modeling of fortresses and castles with UAS. some study cases in Jaen (Southern Spain)**

Javier Cardenal, University of Jaen, Spain

**09:06 Virtual and Physical Re-Composition of Fragmented Ecclesiastical Frescoes Using a Photogrammetric Approach**

Dante Abate, The Cyprus Institute, Cyprus

**09:24 Evaluating Unmanned Aerial Platforms for Cultural Heritage Large Scale**

**Mapping**

Andreas Georgopoulos, ELKE NTUA, Greece

**17/7 08:30 - 10:00 VII/4 - Methods for Image Classification 6**

Session Chair: Boris Mikhailovich Shurygin, Moscow Institute of Physics and Technology

Session Co-Chair: Wei Yao, Munich University of Applied Sciences

**08:30 Plastic and glass greenhouses detection and delineation from WorldView-2 satellite imagery**

Dilek Koc-San, Akdeniz University, Turkey

**08:48 Detection and counting of orchards trees from VHR images using a geometrical-optical model and template matching**

Philippe Maillard, Universidade Federal de Minas Gerais, Brazil

**09:06 A Method to Estimate Temporal Interaction in a Conditional Random Field Based Approach for Crop Recognition**

Pedro Diaz, Pontifical Catholic University of Rio de Janeiro, Brazil

**09:24 Global land cover classification using MODIS surface reflectance products**

Haruhisa Shimoda, Tokai University, Japan

**09:42 Rotation Matrix Sampling Scheme for Multidimensional Probability Distribution Transfer**

Panu Srestasathien, Geo-informatics and Space Technology Development Agency (GISTDA), Thailand

**17/7 08:30 - 10:00 VIII/7 - Forestry, Natural Ecosystems & Biodiversity 1**

Session Chair: Guoqing Zhou, Guilin University of Technology

Session Co-Chair: Brian Alan Johnson, Institute for Global Environmental Strategies

**08:30 Voxel based representation of airborne full-waveform laser scanner data**

Nadine Stelling, Technische Universität Dresden, Germany

**08:48 Analysis of the side-lap effect on full-waveform LiDAR data acquisition for the estimation of forest structure variables**

Pablo Crespo-Peremarch, Universitat

Politécnica de València, Spain

**09:06 Accuracy Assessment of Crown Delineation Methods for Individual Trees of a Golf Course Area**

Kuan-Tsung Chang, Ming-hsin University of Science and Technology, Taiwan

**09:24 Tree canopy cover mapping using LiDAR in urban barangays of Cebu City, Central Philippines**

Jay Alvarina Ejares, University of San Carlos, Philippines

**17/7 08:30 - 10:00 Youth Forum 1**

Session Chair: Fuan Tsai, National Central University

Session Co-Chair: Ivan Datchev, University of Calgary

**08:30 Standalone terrestrial laser scanning for efficiently capturing AEC buildings for as-built BIM**

Maarten Bassier, KU Leuven, Belgium

**08:48 Statistics for Patch Observations**

Kassel Liam Hingee, University of Western Australia, Australia

**09:06 Measuring polycentricity of mega-city regions in China based on the intercity migration flows**

Xiaoyan MU, HKU, China

**09:24 Short-Term Rainfall Probability and Peak Moment Prediction of Strong Convective Weather Using FY Satellite Data in South China: A Case Study of Shenzhen**

Jun Liu, Chinese Academy of Science, China

**09:42 Field spectroscopy for vegetation evaluation along the nutrient and elevation gradient above the tree line in the Krkonoše Mountains National Park**

Lucie Cervena, Charles University in Prague, Czech Republic

**17/7 10:30 - 12:00 I/Vb - Unmanned Vehicle Systems (UVS): Sensors and Applications 7**

Session Chair: Francesco Nex, University of Twente - ITC Faculty

Session Co-Chair: Görres Jochen  
Grenzdoerffer, Rostock University

**10:30 UAS Topographic Mapping With Velodyne LiDAR Sensor**

Grzegorz Jozkow, The Ohio State University, USA; Wroclaw University of Environmental and Life Sciences, Poland

**10:48 High resolution airborne laser scanning and hyperspectral imaging with a small UAV platform**

Michal Gallay, Pavol Jozef Šafárik University in Košice, Slovak Republic

**11:06 Evaluation of a novel UAV-borne topo-bathymetric laser profiler**

Gottfried Mandlbauer, TU Vienna; Research Forschungsgesellschaft mbH, Austria

**11:24 Evaluation of a metric camera system tailored for high precision UAV applications**

Thomas Kraft, German Aerospace Center, Germany

**17/7 10:30 - 12:00 II/7 - Intelligent Spatial Decision Support**

Session Chair: Qing-Quan Li, Shenzhen University

Session Co-Chair: Yang Yue, Shenzhen University

**10:30 Application of Machine Learning to Prediction of Vegetation Health**

Emily Burchfield, Vanderbilt University, United States of America

**10:48 Comparison of urban human movements inferring from multi-source spatial-temporal data**

Wei TU, Shenzhen University, China

**11:06 Sharing on Web 3D Models of Ancient Theatres. A Methodological Workflow**

Andrea Scianna, National Research Council of Italy (CNR), Italy

**11:24 Analyzing the structure and variation of traffic interactions in urban transportation networks**

Qing-quan Li, Shenzhen University, China

**11:42 Real-time visual analytics for speed anomaly detection based on taxi gps data**

Yang Yue, Shenzhen University, China



**17/7 10:30 - 12:00 III/I - Sensor Modeling for Integrated Orientation and Navigation**

Session Chair: Jan Skaloud, EPFL  
Session Co-Chair: Michael Cramer, Universität Stuttgart

**10:30** Applicability of new approaches of sensor orientation to micro aerial vehicles  
Martin Rehak, EPFL TOPO, Switzerland

**10:48** GEMMA: A generic, extensible and modular multi-sensor navigation analysis system  
José Navarro, CTTC, Spain

**11:06** Metric calibration of a focused plenoptic Camera based on a 3D calibration target  
Niclas Zeller, Karlsruhe University of Applied Sciences; Technische Universität München, Germany

**11:24** Centimeter-level, robust GNSS-Aided inertial post-processing for mobile mapping without local reference stations  
Nilesh Gopaul, Trimble - Applanix, Canada

**17/7 10:30 - 12:00 IV/ThS 8 - Recent mapping of small planetary satellites, asteroids and comets**

Session Chair: Randolph Kirk, U.S. Geological Survey  
Session Co-Chair: Cristina Re, INAF

**10:30** Geological mapping of Pluto and Charon using New Horizons data  
Jeffrey M. Moore, NASA Ames Research Center, USA

**10:48** Topographic Mapping of Pluto and Charon Using New Horizons Data  
Paul Schenk, Lunar and Planetary Institute, USA

**11:06** NASA's planetary geologic mapping program: overview  
David Allen Williams, Arizona State University, USA

**11:24** EU-FP7-iMARS: analysis of Mars multi-resolution images using auto-coregistration, data mining and crowd source techniques: processed results – a

first look

Jan-Peter Muller, UCL Mullard Space Science Laboratory, United Kingdom

**17/7 10:30 - 12:00 V/1 - Vision Metrology 3**

Session Chair: Thomas Luhmann, Jade University of Applied Sciences  
Session Co-Chair: Stuart Robson, UCL

**10:30** Photogrammetric Tracking of Aerodynamic Surfaces and Aerospace Models at NASA Langley Research Center  
Mark R. Shortis, RMIT University, Australia

**10:48** Object deformations from image silhouettes using a kinematic finite-element beam model  
Christian Jepping, Jade University, Germany

**11:06** Structural 3D monitoring using a new sinusoidal fitting adjustment  
Ivan Detchev, University of Calgary, Canada

**11:24** Shape function-based estimation of deformation with moving cameras attached to the deforming body  
Henrik Haggrén, Aalto University; Mapvision Ltd., Finland

**11:42** Deformation Monitoring of Materials Under Stress in Laboratory Experiments  
Dimitrios P. Skarlatos, Cyprus University of Technology, Cyprus

**17/7 10:30 - 12:00 VII/4 - Methods for Image Classification 7**

Session Chair: Fariba Mohammadimanesh, C-CORE and Memorial University of Newfoundland, Canada  
Session Co-Chair: Ribana Roscher, University of Bonn

**10:30** Effect Of Pansharpened Image On Some Of Pixel Based And Object Based Classification Accuracy  
Pinar Karakus, Selcuk University, Turkey

**10:48** Benchmark of machine learning methods for classification of a Sentinel-2 image  
Filiz Sunar, Istanbul Technical University, Turkey

**11:06** A Kernel Method Based on Topic Modelling for VHRS Remote Sensing Image

## Classification

Linmei Wu, Southwest Jiaotong University, China

**11:24** Object based agricultural land cover classification of shadowed areas from aerial image and lidar data using support vector machine

Ronaldo T. Alberto., Central Luzon State University, Nueva Ecija

## 17/7 10:30 - 12:00 VIII/7 - Forestry, Natural Ecosystems & Biodiversity 2

Session Chair: Nadine Stelling, Technische Universität Dresden

Session Co-Chair: Pablo Crespo-Peremarch, Universitat Politècnica de València

**10:30** Characteristics of the Earth Observation data used in the proposed UNFCCC REDD+ forest reference emission levels (FRELs)

Brian Alan Johnson, Institute for Global Environmental Strategies, Japan

**10:48** Attribution and characterisation of Sclerophyll forested landscapes over large areas

Simon Jones, RMIT, Australia

**11:06** Response of Riparian Vegetation in Australia's Largest River Basin to Inter and Intra-Annual Climate Variability and Flooding as Quantified with Landsat and MODIS

Mark Broich, UNSW, Australia

**11:24** Ability of Landsat-8 OLI derived texture metrics in estimating aboveground carbon stocks of coppice Oak Forests

Hormoz Sohrabi, TMU, Iran

## 17/7 10:30 - 12:00 Youth Forum 2

Session Chair: Ursa Kanjir, ZRC SAZU

Session Co-Chair: Hiroyuki Miyazaki, University of Tokyo

**10:30** A novel removal method for dense stripes in remote sensing images

Xinxin Liu, Wuhan University, China

**10:48** Evaluating the potential of rtk-uav for automatic point cloud generation in 3d rapid mapping

Haidar Fazeli, University of Tehran, Iran

**11:06** Research into the collimation and horizontal axis errors influence on the Z+F laser scanner accuracy of verticality measurement

Jan Michał Sawicki, Warsaw University of Technology, Poland

**11:24** Monitoring the Surface Heat Island (SHI) effects of industrial enterprises

Alihsan Sekertekin, Bulent Ecevit University, Turkey

**11:42** Synergy of Optical and SAR Data for Mapping and Monitoring Mangroves

Sheryl Rose Reyes, University of the Philippines - Diliman, Philippines; Fauna & Flora International; Philippine Council for Industry, Energy and Emerging Technology

## 17/7 13:30 - 15:00 I/4 - Geometric and Radiometric Modeling of Optical Airborne and Spaceborne Sensors 3

Session Chair: Karsten Jacobsen, Leibniz University Hannover

Session Co-Chair: Pablo d'Angelo, DLR

**13:30** Accuracy Validation of Large-scale Block Adjustment without Control of ZY3 Images over China

Bo Yang, Wuhan University, China

**13:48** Penalized spline: a general robust trajectory model for ZiYuan-3 satellite

Hongbo Pan, Central South University, China

**14:06** Improving semi-global matching: Cost aggregation and confidence measure

Pablo d'Angelo, DLR, Germany

**14:24** Geometric and radiometric evaluation of RASAT images

Ali Cam, Bulent Ecevit University, Turkey

## 17/7 13:30 - 15:00 II/8 - Mobility: Tracking, Analysis and Communication

Session Chair: Monika Sester, Leibniz Universität Hannover

**13:30** Analysis of spatio-temporal traffic patterns based on pedestrian trajectories

Steffen Busch, Leibniz Universität Hannover, Germany

**13:48** The trade-off between privacy and geographic data resolution. A case of GPS

trajectories combined with social survey.  
Katarzyna Sila-Nowicka, University of  
Glasgow, United Kingdom

**14:06 Long-term tracking of a specific  
vehicle using airborne optical camera  
systems**  
Franz Kurz, German Aerospace Center,  
Germany

**14:24 Efficient and Accurate Indoor  
Localization Using Landmark Graphs**  
Fuqiang Gu, University of Melbourne, Australia

## 17/7 13:30 - 15:00 III/1 - Orientation and Surface Reconstruction 4 + III/4 - 3D Scene Analysis 3

Session Chair: Helmut Mayer, Bundeswehr  
University Munich

Session Co-Chair: Jan Dirk Wegner, ETH  
Zurich

**13:30 Enhancement of generic building  
models by recognition and enforcement of  
geometric constraints**  
Jochen Meidow, Fraunhofer IOSB, Germany

**13:48 Robust low-altitude image matching  
based on local region constraint and feature  
similarity confidence**  
Min Chen, Southwest Jiaotong University,  
China

**14:06 Invariant descriptor learning using a  
Siamese Convolutional Neural Network**  
Lin Chen, Leibniz Universität Hannover,  
Germany

**14:24 Rigorous Geometric Modelling of  
1960s ARGON Satellite Images for Antarctic  
Ice Sheet Stereo Mapping**  
Gang Qiao, Tongji University, China

**14:42 A Euclidean Formulation of Interior  
Orientation Constraints Imposed by the  
Fundamental Matrix**  
Ilias Kalisperakis, Technological Educational  
Institute of Athens, Greece

## 17/7 13:30 - 15:00 V/2 - Cultural Heritage Data Acquisition and Processing: UAV and Photogrammetry for CH survey

Session Chair: Pierre Grussenmeyer, INSA

Strasbourg

Session Co-Chair: Robert Alexander Hautb,  
Griffith University

**13:30 3D Recording of a 19-Century Ob  
River Ship**  
Andrei A. Pushkarev, National Research  
Tomsk State University, Russian Federation

**13:48 Documentation of historical  
underground object in Skorkov village with  
selected measuring methods, data analysis  
and visualization**  
Adam Dlesk, CTU in Prague, Czech Republic

**14:06 Point cloud mapping methods for  
documenting cultural landscape features at  
the Wormsloe State Historic Site, Savannah,  
Georgia, USA**  
Thomas Robert Jordan, University of Georgia,  
USA

## 17/7 13:30 - 15:00 VII/5 - Methods for Change Detection and Process Mo- delling 2

Session Chair: Haigang Sui, Wuhan  
University

Session Co-Chair: Georg Bareth, University  
of Cologne

**13:30 Using label noise robust logistic  
regression for automated updating of  
topographic geospatial databases**  
Alina Elisabeth Maas, Leibniz Universität  
Hannover, Germany

**13:48 Change detection with multi-source  
defective remote sensing images based on  
evidential fusion**  
Jing Li, Beijing Normal University; State Key  
Laboratory of Earth Surface Processes and  
Resource Ecology, China

**14:06 Change detection in UAV video  
imagery combining a feature based  
approach and extended image differencing**  
Günter Saur, Fraunhofer IOSB, Germany

**14:24 An Automatic Optical and SAR Image  
Registration Method Using Iterative Multi-  
Level and Refinement Model**  
Haigang Sui, Wuhan University, China

## 17/7 13:30 - 15:00 VII/ThS 3 - Sentinel-I Radar



Session Chair: Mattia Crespi, University of Rome La Sapienza

Session Co-Chair: Michele Crosetto, CTTC

**13:30 Exploiting Sentinel-1 amplitude data for glacier surface velocity field measurements: feasibility demonstration on Baltoro Glacier**

Andrea Nascetti, University of Rome "La Sapienza", Italy

**13:48 Potential of Sentinel-1A for nationwide routine updates of active landslide maps**

Milan Lazecky, VSB-TUO, Czech Republic

**14:06 Comparison between Spectral, Spatial and Polarimetric Classification of Urban and Peri-Urban Landcover Using Temporal Sentinel-1 Images**

Koel Roychowdhury, Presidency University, India

**14:24 Forest area derivation from Sentinel-1 data**

Alena Dostálová, TU Wien, Austria

**14:42 Land cover mapping using Sentinel-1 SAR data**

Saygin Abdikan, Research Council (CNR), Italy

**17/7 13:30 - 15:00 VIII/7 - Forestry, Natural Ecosystems & Biodiversity 3 + ThS 10 - Spatial ecology and ecosystem services mapping using Essential Biodiversity Variables (EBVs)**

Session Chair: Matti Tapio Vaaja, Aalto University

Session Co-Chair: Mateusz Karpina, Wrocław University of Environmental and Life Sciences

**13:30 Optimal wavelength selection on hyperspectral data with fused lasso for biomass estimation of tropical rain forest**

Taichi Takayama, University of Tokyo; Mitsubishi Research Institute, Inc., Japan

**13:48 Use of a multispectral UAV photogrammetry for detection and tracking of forest disturbance dynamics**

Robert Minařík, Charles University in Prague, Czech Republic

**14:06 Deforestation along the maya mountain massif belize-guatemala western border**

Santos Daniel Chicas, Nagasaki University, Japan; University of Belize, Belize

**14:24 Biodiversity mapping via Natura 2000 conservation status assessment using airborne laser scanning in alkali grasslands**

Norbert Pfeifer, Vienna University of Technology, Austria

**14:42 New Approach for Segmentation and Extraction of Single Tree from Point Clouds Data and Aerial Images**

Amir Saeed Homainejad, Independent Research Group on Geospatial, Iran

**17/7 13:30 - 15:00 VIII/8 - Land Cover and its Dynamics, Including Agricultural & Urban Land Use 3**

Session Chair: Dimitris Stathakis, University of Thessaly

Session Co-Chair: Ervin Wirth, Budapest University of Technology and Economics

**13:30 Crop Species Recognition and Discrimination Paddy Rice Growing Fields from Reaped Fields by the Radar Vegetation Index (RVI) of ALOS-2/PALSAR-2**

Yasuharu Yamada, National Agriculture and Food Research Organization, Japan

**13:48 Mapping secondary forest succession on abandoned agricultural land in the Polish Carpathians**

Natalia Kolecka, Jagiellonian University, Poland

**14:06 Urban land cover/use change detection using high resolution spot 5 and spot 6 images and urban atlas nomenclature**

Semih Sami Akay, Istanbul Technical University, Turkey

**14:24 Identifying Urban Climate Zones from HJ-1B Satellite Data Using Self-Organizing Maps**

Chunzhu Wei, University of Salzburg, Austria

**14:42 Rice Yield Estimation Through Assimilating Satellite Data Into a Crop Simulation Model**

Son Thanh Nguyen, National Central University, Taiwan

**17/7 13:30 - 15:00 Youth Forum 3**

Session Chair: Krzysztof Sterenczak, Forest Research Institute

Session Co-Chair: Sheryl Rose Reyes, University of the Philippines – Diliman

**13:30 Precise Target Geolocation and Tracking Based on UAV Video Imagery**

Farzaneh Dadrasjavan, Tehran University, Iran

**13:48 Statistic tests aided multi-source DEM fusion**

Chao-Yang Fu, National Cheng Kung University, Taiwan

**14:06 Pose Estimation of Unmanned Aerial Vehicles Based on A Vision-Aided Multi-Sensor Fusion**

Farhad Samadzadegan, University of Tehran, Iran

**14:24 Analysis of Jure Landslide Dam, Sindhupalchowk Using GIS and Remote Sensing**

Tri Dev Acharya, Kangwon National University, Korea

**14:42 The Classical Assumption Test to Driving Factors of Land Cover Change in the Development Region of Northern Part of West Java**

Nur Ainiyah, ITB, Indonesia

**17/7 15:00 - 16:30 Interactive session**

(II/3, II/7, II/8, III/I, VII/4, VIII/8, ThS1, ThS3, ThS13, ThS14, YF)

**II/3 - Spatial Analysis and Data Mining**

A novel similarity assessment for remote sensing image via fast association rule mining

Jun Liu, Chinese Academy of Science, China

Change semantic constrained online data cleaning method for Real-time observational data stream

Yulin DING, The Chinese University of Hong Kong, China; Southwest Jiaotong University, China

Modelling Biophysical Parameters for Winter Wheat and Maize Using High-Resolution Remote Sensing Time Series

Thorsten Dahms, University of Wuerzburg,

Germany

**Future Estimation of Convenience Living Facilities Withdrawal due to Population Decline All over Japan from 2010 to 2040 - Focus on Supermarkets, Convenience Stores and Drugstores**

Yuka Nishimoto, The University of Tokyo, Japan

**Remote sensing-based detection and spatial pattern analysis for geo-ecological niche modeling of Tillandsia spp. in the Atacama, Chile**

Nils Wolf, Heidelberg University of Education, Germany

**Using mcda and gis for landfill site selection: central districts of Antalya province, Turkey**

Bekir Taner San, Akdeniz University, Turkey

**Urban Rain Gauge Sitting Selection Based on GIS-Multicriteria analysis**

Changfeng Jing, Beijing University of Civil Engineering and Architecture, China

**Spatio-Temporal Analysis of Urban Heat Island in Basin City Based on Remote Sensing Techniques**

Hsiao-Tung Chang, Chinese Culture University, Taiwan

**Analysis of the pit removal methods in digital terrain models of various resolutions**

Sanja Samanovic, Institute of Cartography and Photogrammetry, Croatia

**Implementation of kriging methods in mobile GIS to estimate damage to buildings in crisis scenarios**

Simon Laun, Karlsruhe Institute of Technology, Germany

**The Design and Product of National 1:10 00000 Cartographic Data of Topographic Map**

Guizhi WANG, National Geomatics Center of China, China

**Determining suitable areas for more efficient hazelnut production**

Oguz Gungor, Karadeniz technical University, Turkey

## **GIS as Decision Support System in geoportal Kielce**

*Beata Hejmanowska, AGH University of Science and Technology; Kielce University of Technology, Poland*

## **School Mapping and Geospatial Analysis of the Schools: A Case Study of Jasra Development Block, Allahabad, India**

*Sonam Agrawal, Motilal Nehru National Institute of Technology, India*

## **II/7 - Intelligent Spatial Decision Support**

### **A Geographic Analysis of Optimal Signage Location Selection in Scenic Area**

*Ling Ruan, Nanjing Normal University; Jiangsu Center for Collaborative Innovation in Geographical Information Resource Development and Application, China*

### **Measure landscape diversity with logical scout agents**

*György Szabó, Budapest University of Technology and Economics, Hungary*

## **II/8 - Mobility: Tracking, Analysis and Communication**

### **A multidisciplinary analytical framework for studying active mobility patterns**

*Daniel Orellana, Universidad de Cuenca, Ecuador*

### **Mining Spatio-Temporal Patterns of the Elder's Daily Movement**

*Cheng-Ru Chen, National Central University, Taiwan*

## **III/I - Sensor Modeling for Integrated Orientation and Navigation**

### **Application of vehicle dynamic modeling in UAVs for precise determination of exterior orientation**

*Mehran Khaghani, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland*

### **Hybrid models for trajectory error modelling in urban environments**

*Eduard Angelats, CTTC; GeoNumerics S. L, Spain*

### **Correction of airborne pushbroom images orientation using bundle adjustment of**

### **frame images**

*Kévin Barbieux, Ecole Polytechnique Fédérale de Lausanne, Switzerland*

## **VII/4 - Methods for Image Classification**

### **Relationship between HIMAWARI-8-derived overshooting tops and extreme weather events in Southeast Asia**

*Miae Kim, UNIST, Korea*

### **Interval type-2 fuzzy based neural network for high resolution remote sensing image segmentation**

*Chunyan Wang, Liaoning Technical University, China*

### **Extracting Urban Ground Object Information from Images and LiDAR Data**

*Lina Yi, China University of Mining and Technology, China*

### **Cloud detection of optical satellite images using support vector machine**

*Kuan-Yi Lee, National Chen Kung University, Taiwan*

### **Coupling regular tessellation with RJMCMC algorithm to segment SAR image with unknown number of classes**

*Yu Wang, Liaoning Technical University, China*

### **Fully automatic approach to VHR satellite image classification**

*Joanna Pluto-Kossakowska, Warsaw University of Technology, Poland*

### **S-CNN-Based ship detection from high-resolution remote sensing images**

*Ruiqian Zhang, Wuhan University, China*

### **Mapping tropical forest for sustainable management using spot 5 satellite image**

*Thi Thanh Huong Nguyen, Tay Nguyen University, Vietnam*

### **Entropy-KL strategy for Fixing Number of Categories**

*Xuemei Zhao, Liaoning Technical University, China*

### **Object based image classification, earthquake**

*Zehra Damla Uca Avci, Istanbul Technical University, Turkey*



**Estimating Wood Volume for Pinus Brutia Trees in Forest Stands from Quickbird-2 Imagery**

*Petros Patias, The Aristotle University, Greece*

**Applicability evaluation of objectness detection method to satellite and aerial imageries**

*Keita Kamiya, the University of Tokyo, Japan*

**The application of support vector machine (svm) using cielab color model, color intensity, and color constancy as features for ortho image classification of benthic habitats in hinatuan, surigao del sur, philippines**

*Michelle V. Japitana, Phil-LiDAR 2.B.14 Caraga State University, Philippines*

**Object-Based Greenhouse Classification From High Resolution Satellite Imagery: A Case Study Antalya-Turkey**

*Namik Kemal Sonmez, Akdeniz University, Turkey*

**Assessment of Multiresolution Segmentation for Extracting Greenhouses from Worldview-2 Imagery**

*Manuel Angel AGUILAR, University of Almeria, Spain*

**Scene classification based on the semantic-feature fusion fully sparse topic model for high spatial resolution remote sensing imagery**

*Qi qi Zhu, Wuhan University, China*

**Analyzing Spectral Characteristics of Shadow Area from ADS-40 High Radiometric Resolution Aerial Images**

*Yi-Ta Hsieh, National Pingtung University of Science and Technology, Taiwan*

**Region of interest detection based on histogram segmentation for satellite image**

*Warinthorn Kiadtikornthaweeyot, Geo-Informatics and Space Technology Development Agency, Thailand*

**Monitoring of the Riverbeds of Rivers Dniester and Tisza of the Carpathian Region**

*Khrystyna Burshtynska, Lviv National*

*Politechnic University, Ukraine*

**The Generation of Automatic Mapping for Buildings in Bogota Colombia, Using High Spatial Resolution Digital Vertical Aerial Photography**

*William Barragan, Universidad Distrital, Colombia*

**VIII/8 - Land Cover and its Dynamics, Including Agricultural & Urban Land Use**

**Rice Crop Mapping Using Sentinel-1A Phenological Metrics**

*Chi-Farn Chen, CSRSR, National Central University, Taiwan*

**Monitoring Land Use Dynamics of peri-urban Agriculture in Central Kenya with RapidEye Satellite Imagery**

*Maximilian Willkomm, University of Cologne, Germany*

**Geospatial Information from Satellite Imagery for Geovisualisation of Smart Cities in India**

*Madan Mohan, Jawaharlal Nehru University, India*

**Landsat 8 multispectral and pansharpened imagery processing on the study of civil engineering issues**

*Aikaterini C. Karagianni, Aristotle University of Thessaloniki, Greece*

**Remote sensing efficiency for urban analysis of Mecca and surrounds**

*Ayman Imam, Polytechnic University of Catalonia, Spain; King AbdulAziz University, Kingdom of Saudi Arabia*

**The Detection of Transport Land-use Data Using Crowdsourcing Taxi Trajectory**

*Tinghua Ai, Wuhan University, China*

**Using Landsat 8 image time series for crop mapping in Casa Branca municipality, Brazil**

*Hugo Bendini, Remote Sensing Division of the National Institute for Space Research, Brazil*

**Dynamic monitoring and intensity estimation of soil and water losses using remote sensing and gis techniques: a**

**case study of jialing river, yangtze river, china**

*Yijin Wu, Central China Normal University, China*

**Vegetation changes and the relationship with climate variability in the upper and middle reaches of the Nenjiang River Basin, China**

*Fang Huang, Northeast Normal University, China*

**Multi-agent based simulation of optimal urban land use allocation in the middle reaches of the Yangtze river, China**

*Yongnian Zeng, Central South University, China*

**A study on TerraSAR-X data observation time for the classification of planting condition of paddy fields**

*Atsushi Kimura, Pasco Corporation, Japan*

**Prediction of changes in vegetation distribution under climate change scenarios using MODIS dataset.**

*Hidetake Hirayama, Graduate of Tokyo University of Information Sciences, Japan*

**Remotely-sensed urban wet-landscapes: an indicator of coupled effects of human impact and climate change**

*Wei Ji, The University of Missouri - Kansas City, USA*

**Identification and analysis of urban surface temperature patterns in Wuhan City, China**

*Hongyuan Huo, Tianjin Normal University, China*

**Land Use and Land Cover Changes and Urban Sprawl in Riyadh, Saudi Arabia: An Analysis using Multi-Temporal Landsat data and Shannon's Entropy Index**

*Muhammad Tauhidur Rahman, King Fahd University of Petroleum and Minerals, Saudi Arabia*

**Using Satellite Data for Environmental Impact Analysis in Economic Growth: The Case of Mongolia**

*Tungalag Amar, National University of Mongolia; Mongolian Geospatial Association, Mongolia*

**Automated classification of land cover using Landsat 8 OLI surface reflectance product and spectral pattern analysis concept - case study in Hanoi, Vietnam**

*Duong Nguyen Dinh, Institute of Geography, Vietnam Academy of Science and technology, Vietnam*

**A Spatial Analysis on GIS-Hedonic Pricing Model on the Influence of Public Open Space and House Price in Klang Valley, Malaysia**

*M Zainora Asmawi, International Islamic University Malaysia, Malaysia*

**Monitoring of in-field variability for site specific crop management through open geospatial information**

*Tomáš Řezník, Masaryk University, Czech Republic*

**Object-based classification and change detection of Hokkaido, Japan**

*Jonggeol Park, Tokyo University of Information Sciences, Japan*

**Relationship between landcover pattern and surface net radiation in an coastal city**

*Xiaofeng Zhao, Chinese Academy of Sciences, China*

**Urban vegetation mapping based on HJ-1A/B NDVI time series**

*Li Feng, Hohai university, China*

**Using Multi-Criteria Analysis for the Study of Human Impact on Agro-Forestry-Pastoral Ecosystem in the Region of Khenchela (Algeria)**

*Bouzekri Abdelhafid, University of Batna, Algeria*

**The estimate of the spatial-temporal features of vegetation cover of Kazakhstan based on time series satellite indices in 2000-2015**

*Lev Spivak, Dubna International University for Nature, Society and Man, Russia*

**Modelling the relationship between land surface temperature and landscape patterns of land use land cover classification using multi linear regression models**

*Florencio V Puno Campomanes, University of the Philippines Cebu Phil-LiDAR 2, Philippines*

## **Rabi cropped area forecasting of parts of Banaskatha District, Gujarat using MRS RISAT-1 SAR data**

*Rutu Parekh, CEPT University, India*

## **ThS 1 - Validation and Analyses of Globe Land Cover**

### **A study on producing highly reliable reference data sets for global land cover validation**

*Noriko Soyama, Tenri University, Japan*

## **ThS 3 - Sentinel-I Radar**

### **Segmentation And Classification Of Nepal Earthquake Induced Landslides Using Sentinel-1 Product**

*Saket Kunwar, NARMA, Nepal*

## **ThS 13 - Linked Geospatial Data**

### **The potential of strava data to contribute in non-motorised transport (nmt) planning in Johannesburg.**

*Mmagomoshabane Kadibetso Selala, University of Johannesburg, South Africa*

## **ThS 14 - Recent Developments in Open Data**

### **Big Geo Data Management: An Exploration with Social Media and Telecommunications Open Data**

*Carolina Arias Munoz, Politecnico di Milano, Italy*

### **Issues on building Kazakhstan Geospatial Portal to implement e-Government**

*HaeKyong Kang, Korea Research Institute for Human Settlements, Korea*

### **Implementation of Vgi-Based Geoportal for Empowering Citizen's Geospatial Observatories Related to Urban Disaster Management**

*Sanghoon Lee, National Geographic Information Institute, Korea*

### **An Object-Relational IFC Storage Model Based on Oracle Database**

*Hang Li, Wuhan university, China*

## **Youth Forum**

### **Statistics for Patch Observations**

*Kassel Liam Hingee, University of Western Australia, Australia*

### **Assessing 3-D photogrammetry techniques in craniometrics**

*Moleseng Claude Moshobane, Kirstenbosch Research Centre; Stellenbosch University; University of Pretoria, South Africa*

### **The Potential of GIS as a Management Tool for Avenue Trees Population in Small Communities; A Case Study of Idi-Ishin Community, Ibadan, Nigeria**

*Oluwayemisi Samuel Olokeogun, Federal College of Forestry, Nigeria*

### **Indoor positioning and navigation by based on control spherical panoramic images**

*Tsung Che Hunag, National Cheng Kung University, Taiwan*

## **Rescheduled interactive presentations**

### **Accuracy Assesment for Orthoimage Using Smart Camera UAV**

*Hohyun Jeong, Pukyong National University, Korea*

## **17/7 16:30 - 18:00 I/4 - Geometric and Radiometric Modeling of Optical Airborne and Spaceborne Sensors 4**

Session Chair: Peter Reinartz, DLR

Session Co-Chair: Carola Luzia Braun, Bundeswehr Geoinformation Centre

### **16:30 Satellite Stereo based Digital Surface Model Generation using Semi Global Matching in Object and Image Space**

*Sajid Ghuffar, Institute of Space Technology, Pakistan*

### **16:48 2D sub-pixel disparity measurement using QPEC / Medicis**

*Myriam Cournet, CNES, France*

### **17:06 A New Algorithm for Void Filling in a DSM from Stereo Satellite Images in Urban Areas**

*Zeinab Gharib Bafghi, German Aerospace Center (DLR), Germany*

### **17:24 On-orbit geometric calibration**



approach for high-resolution geostationary optical satellite GaoFen-4

Yufeng Cheng, Wuhan University, China

## 17/7 16:30 - 18:00 II/ThS 14 - Recent Developments in Open Data

Session Chair: Maria Antonia Brovelli, Politecnico di Milano

Session Co-Chair: HaeKyong Kang, Korea Research Institute for Human Settlements

**16:30** Do open geodata actually have the quality they declare? The case study of Milan, Italy

Miriam Molteni, Politecnico di Milano, Italy

**16:48** Positional accuracy assessment of the OpenStreetMap buildings layer through automatic homologous pairs detection: the method and a case study

Maria Antonia Brovelli, Politecnico di Milano, Italy

**17:06** Sensing slow mobility and interesting locations for Lombardy Region (Italy): a case study using pointwise geolocated open data

Daniele Oxoli, Politecnico di Milano, Italy

**17:24** Geographic Data as Personal Data in Four EU Member States

Bastiaan van Loenen, Delft University of Technology, the Netherlands

**17:42** An Open Science approach to GIS-based paleoenvironment data

Christian Willmes, University of Cologne, Germany

## 17/7 16:30 - 18:00 IV/SpS 4 - ICA: Image maps- theory, methods, standards

Session Chair: Vít Voženílek, Palacky University Olomouc

Session Co-Chair: Lynn Usery, US Geological Survey

**16:30** The Cartographic Concept of the Image Map

Vít Voženílek, Palacky University Olomouc, Czech Republic

**16:48** User Preferences in Image Map Using

Alena Vondrakova, Palacky University Olomouc, Czech Republic

**17:06** Transformation Methods for Using

Combination of Remotely sensed data and Cadastral Maps

Saziye Ozge Donmez, Istanbul Technical University, Turkey

**17:24** Determining the suitability of different digital elevation models and satellite images for fancy maps. An example of Cyprus

Jacek Drachal, Institute of Geodesy and Cartography, Poland

## 17/7 16:30 - 18:00 V/3 - Terrestrial 3D Imaging and Sensors 3

Session Chair: Francesco Pirotti, University of Padova

Session Co-Chair: Daniel Wujanz, Technische Universität Berlin

**16:30** Quality Assessment and Comparison of Smartphone, Airborne and Leica C10 Laser Scanner Based Point Clouds

Roderik Lindenbergh, Delft University of Technology, the Netherlands

**16:48** An empirical point error model for TLS derived point clouds

Mustafa Ozendi, Bulent Ecevit University, Turkey

**17:06** Crowdsourcing Based 3D Modelling

Arpad Somogyi, Budapest University of Technology and Economics, Hungary

**17:24** Assessment of a static multibeam sonar scanner for 3D surveying in confined subaquatic environments

Emmanuel Moisan, Cerema; Cube Laboratory, France

**17:42** Comparative Geometrical Investigations of Hand-Held Scanning Systems

Heinz-Juergen Przybilla, Bochum University of Applied Sciences, Germany

## 17/7 16:30 - 18:00 VII/5 - Methods for Change Detection and Process Modelling 3

Session Chair: Haigang Sui, Wuhan University

Session Co-Chair: Nora Tilly, University of Cologne

**16:30** Monitoring of fluvial transport in the mountain river bed using terrestrial laser scanning

Grzegorz Jozkow, Wroclaw University of Environmental and Life Sciences, Poland

**16:48** Comparison of C-Band and X-Band Polarimetric SAE Data for River Ice Classification on the Peace River

Helena Łoś, Warsaw University of Technology, Poland

**17:06** Irregular ice sheet layering detected by radar echo sounder south to north Greenland EEMian ice drilling station

Siting Xiong, University College London, United Kingdom

**17:24** Building change detection in very high resolution satellite stereo image time series

Peter Reinartz, DLR, Germany

#### 17/7 16:30 - 18:00 VIII/7 - Forestry, Natural Ecosystems & Biodiversity 4

Session Chair: Taichi Takayama, University of Tokyo

Session Co-Chair: Robert Minařík, Charles University in Prague, Faculty of Science

**16:30** Effect of wind on tree stem parameter estimation using terrestrial laser scanning

Matti Tapio Vaaja, Aalto University, Finland

**16:48** UAV-based automatic tree growth measurement for biomass estimation

Mateusz Karpina, Wroclaw University of Environmental and Life Sciences, Poland

**17:06** Monitoring Seabirds and Marine Mammals by Georeferenced Aerial Photography

Gerhard Kemper, GGS GmbH, Germany

**17:24** Subtropical forest biomass estimation using airborne LiDAR and Hyperspectral data

Yong Pang, Chinese Academy of Forestry, China

**17:42** Deriving Empirical Relationship Between Leaf Biomass of Red Pine Forests and Vegetation Index in South Korea Using Landsat-5 TM

Anibal Gusso, Polytechnic School of UNISINOS, Brazil

#### 17/7 16:30 - 18:00 VIII/8 - Land Cover and its Dynamics, Including Agricultural & Urban Land Use 4

Session Chair: Semih Sami Akay, Istanbul Technical University

**16:30** Forecasting urban expansion based on lights

Demetris Stathakis, University of Thessaly, Greece

**16:48** Potential application of novel hyperspectral lidar for monitoring crops nitrogen stress

Shuo Shi, Wuhan University; Collaborative Innovation Center of Geospatial Technology, China

**17:06** Analysis of the Intra-City Variation of Urban Heat Island and its Relation to Land Surface Parameters

Deniz Gerçek, Kocaeli University, Turkey

**17:24** Towards a remote sensing based assessment of land susceptibility to degradation: examining seasonal variation in land use-land cover for modelling land degradation in a semi-arid context

Gofamodimo Mashame, Botswana International University of Science and Technology, Botswana

**17:42** Measure of landscape heterogeneity by agent-based methodology

Ervin Wirth, Budapest University of Technology and Economics, Hungary

#### 17/7 16:30 - 18:00 VIII/9 - Coastal and Ocean Applications 1

Session Chair: Samantha Jane Lavender, Pixalytics Ltd

Session Co-Chair: Eileen Johnson, Bowdoin College

**16:30** Shanghai shoreline evolution interpreted from historical atlas and remote sensing imagery over the past 2,200 years

Huan Mi, Tongji University, China

**16:48** Beach volume change using uav photogrammetry in songjung beach, korea

Chang-ill Yoo, Pukyong National University, Korea

**17:06** Modelling morphodynamic environments by terrestrial photogrammetry: application to beaches and fluvial systems  
Elena Sánchez-García, Polytechnic University of Valencia, Spain

**17:24** Use of lidar to assess flood impacts on rural coastal communities in Maine  
Eileen Johnson, Bowdoin College, USA

**17:42** Monitoring High-frequency Ocean signals using low-cost GNSS/INS buoys  
Yu-Lun Huang, National Cheng Kung University, Taiwan



# 10

PROGRAM XXIII ISPRS  
MONDAY 18 JULY





## Monday, 18 July, 2016

TIME	LOCATION	SESSION
08:30 - 10:00	Congress Hall	Plenary 3
10:30 - 12:00	Club H	I/4 - Geometric and Radiometric Modeling of Optical Airborne and Spaceborne Sensors 5
	Club A	I/Va - Mobile Scanning and Imaging Systems for 3D Surveying and Mapping 1
	Club D	III/2 - Point Cloud Processing 3
	Club B	V/1 - Vision Metrology 4
	Club C	VI/6 - Technology Transfer and Capacity Development
	Club E	VII/6 - Remote Sensing Data Fusion 3
	Meeting Hall I A	VIII/8 - Land Cover and its Dynamics, Including Agricultural & Urban Land Use 5
	Meeting Hall I B	VIII/9 - Coastal and Ocean Applications 2
13:30 - 15:00	Club A	I/Va - Mobile Scanning and Imaging Systems for 3D Surveying and Mapping 2
	Club H	V/2 - Cultural Heritage Data Acquisition and Processing
	Club B	VII/6 - Remote Sensing Data Fusion 4
	Meeting Hall I A	VIII/7 - Forestry, Natural Ecosystems & Biodiversity 5
	Meeting Hall I B	VIII/8 - Land Cover and its Dynamics, Including Agricultural & Urban Land Use 6
	Club C	VIII/SpS 7 - GEO: Earth Observation and Societal Benefits: Global issues and best practices
	Club E	VII/ThS 5 - 3D information extraction from SAR imagery + VII/ThS 4 - TanDEM-X
15:00 - 16:30	Foyer 3rd Floor	Interactive session (I/4, I/Va, VI/6, VII/1, VII/3, VII/6, VII/7, VIII/7, VIII/9, ThS18, SpS8)

16:30 - 18:00	Club A	I/Va - Mobile Scanning and Imaging Systems for 3D Surveying and Mapping 3
	Club H	V/5 - Close-range Measurements for Biomedical Sciences and Geosciences 4
	Club D	VII/3 - Information Extraction from Hyperspectral Data 2: Hyperspectral applications from Mars to Earth
	Club E	VII/4 - Methods for Image Classification 8
	Meeting Hall I A	VIII/7 - Forestry, Natural Ecosystems & Biodiversity 6
	Meeting Hall I B	VIII/8 - Land Cover and its Dynamics, Including Agricultural & Urban Land Use 7
	Club B	VIII/SpS 15 - URSI: Disaster and Risk Management



## Monday 18 July 2016

### **18/7 08:30 - 10:00 Plenary 3**

Session Chair: Marguerite Madden, University of Georgia

Session Co-Chair: Jon Mills, Newcastle University

#### **08:30 A Vision for Spaceborne Synthetic Aperture Radar (SAR)**

Alberto Moreira, German Aerospace Center (DLR), Germany

#### **09:00 The M.App of the Future is Now**

Mladen Stojic, Hexagon Geospatial

#### **09:30 Sensing the Invisible and Mapping the Future: Use Social Media and Big Data to Monitor Human Dynamics**

Tsou Ming-Hsiang, San Diego State University, USA

### **18/7 10:30 - 12:00 I/4 - Geometric and Radiometric Modeling of Optical Airborne and Spaceborne Sensors 5**

Session Chair: Daniela Poli, Terra Messflug

Session Co-Chair: Karsten Jacobsen, Leibniz University Hannover

#### **10:30 A framework for an automatic seam-line engine**

Belai Beshah, North West Geomatics, Calgary; Hexagon Geosystems, Switzerland

#### **10:48 A new control points based geometric correction algorithm for airborne push broom scanner images without on-board data**

Pavel Strakhov, Moscow Institute of Physics and Technology, Russian Federation

#### **11:06 Determining stand parameters from uas-based point clouds**

Volkan Yilmaz, Karadeniz Technical University, Turkey

#### **11:24 Absolute Radiometric Calibration of KOMPSAT-3A**

Hoyong Ahn, Pukyong National University, Korea

### **18/7 10:30 - 12:00 I/Va - Mobile Scanning and Imaging Systems for 3D Surveying and Mapping 1**

Session Chair: Jonathan Li, University of Waterloo

Session Co-Chair: Jose Alberto Gonçalves, University of Porto

#### **10:30 Monitoring Aircraft Motion at Airports by LiDAR**

Charles K Toth, The Ohio State University, USA

#### **10:48 Rapid inspection of pavement markings using mobile lidar point clouds**

Ming Cheng, Xiamen University, China

#### **11:06 Refinement of Colored Mobile Mapping Data Using Intensity Images**

Toru Yamakawa, The University of Electro-Communications, Japan

#### **11:24 3D Land Cover Classification Based on Multispectral LiDAR Point Clouds**

Xiaoliang Zou, University of Waterloo, Canada

#### **11:42 Monitoring capabilities of mobile mapping systems based on navigation qualities**

Hao Jing, D Laser Mapping Ltd.; University of Nottingham, United Kingdom

### **18/7 10:30 - 12:00 III/2 - Point Cloud Processing 3**

Session Chair: Bisheng Yang, Wuhan University

Session Co-Chair: Ruisheng Wang, University of Calgary

#### **10:30 Detecting and analyzing corrosion spots on the hull of large marine vessels using colored 3d lidar point clouds**

Ahmad Kamal Aijazi, Blaise Pascal University, France

#### **10:48 HELIOS: A Multi-Purpose LiDAR Simulation Framework for Research, Planning and Training of Laser Scanning Operations with Airborne, Ground-Based Mobile and Stationary Platforms**

Sebastian Bechtold, Heidelberg University, Germany

#### **11:06 Airborne multispectral LiDAR data for land-cover classification and land/water mapping using different spectral indexes**

Salem Morsy, Ryerson University; Teledyne Optech, Canada

#### **11:24 Pole-like street furniture decomposition in mobile laser scanning data**

Fashuai Li, University of Twente, Netherlands

**11:42 Automatic extraction of building roof planes from airborne lidar data applying an extended 3d randomized hough transform**  
Evangelos Maltezos, National Technical University of Athens, Greece

## 18/7 10:30 - 12:00 V/1 - Vision Metrology 4

Session Chair: Stuart Robson, UCL

Session Co-Chair: Thomas Luhmann, Jade University of Applied Sciences

**10:30 3D capturing performances of low-cost active range sensors for mass-market applications**

Gabriele Guidi, Politecnico di Milano, Italy

**10:48 Development of a New Low-Cost Indoor Mapping System – System Design, System Calibration and First Results**

Thomas Kersten, HafenCity University Hamburg, Germany

**11:06 Boundary Depth Information Using Hopfield Neural Network**

Sheng Xu, University of Calgary, Canada

**11:24 Optical Triangulation on Instationary Water Surfaces**

Christian Mulsow, TU-Dresden; BAW Karlsruhe, Germany

**11:42 A novel approach to camera calibration method for smart phones under road environment**

Zhou Jian, Wuhan University, China

## 18/7 10:30 - 12:00 VI/6 - Technology Transfer and Capacity Development

Session Chair: Armin Gruen, ETH Zurich

Session Co-Chair: Huayi Wu, Wuhan University

**10:30 Development and evaluation of science and technology education program using interferometric SAR**

Yosuke Ito, Naruto University of Education, Japan

**10:48 A framework for capacity building in mapping coastal resources using remote sensing in the Philippines**

Ayin Tamondong, University of the Philippines, Philippines; Phil-LiDAR 2 CoastMap

**11:06 Bridging the gap between NASA Earth observations and decision makers through the NASA DEVELOP National Program**

Caren M. Remillard, University of Georgia, Georgia

**11:24 Geo-informatics in India: Major Milestones and present scenario**

Stutee Gupta, Indian Institute of Remote Sensing, India

## 18/7 10:30 - 12:00 VII/6 - Remote Sensing Data Fusion 3

Session Chair: Qiming Zhou, Hong Kong Baptist University

Session Co-Chair: Jinghui YANG, Deutsches Zentrum für Luft- und Raumfahrt (DLR)

**10:30 Methodology for Orientation and Fusion of Photogrammetric and LiDAR Datas for Multitemporal Studies**

Carlos Manuel Colomo Jiménez, University of Jaén, Spain

**10:48 Merging Digital Surface Models and Bayesian Approaches**

Haval Abduljabbar Sadeq, Salahaddin University-Erbil, Iraq

**11:06 Estimation of Regional Forest Aboveground Biomass Combining ICESat-GLAS Waveforms and HJ-1A/HSI Hyperspectral Imageries**

Yanqiu Xing, Northeast Forestry University, China

**11:24 Classification of croplands through fusion of optical and SAR time series data**  
Seonyoung Park, Ulsan National Institute of Science and Technology, Korea

**11:42 Intergration of lidar data with aerial imagery for estimating rooftop solar photovoltaic potentials in city of Cape Town**  
Adedayo Kelvin Adeleke, University of Cape Town, South Africa

## 18/7 10:30 - 12:00 VIII/8 - Land Cover and its Dynamics, Including Agricultural & Urban Land Use 5

Session Chair: Syed M. Irteza, Hong Kong Polytechnic University

Session Co-Chair: Vojtech Lukas, Mendel University in Brno

**10:30 Precision viticulture from multitemporal, multispectral very high resolution satellite data**  
Zacharias Kandylakis, National Technical University of Athens, Greece

**10:48 Classification of LISS IV Imagery Using Texture Based Decision Tree Method**  
Amit Kumar Verma, Indian Institute of Technology Roorkee, India

**11:06 Inter-seasonal dynamics of vegetation cover and surface temperature distribution: a case study of Ondo State, Nigeria.**  
Henry Adeniyi Ibitolu, Onidex Geospatial Solutions, Nigeria

**11:24 Non-Trivial Feature Derivation for Intensifying Feature Detection Using LiDAR Datasets Through Allometric Aggregation Data Analysis Applying Diffused Hierarchical Clustering for Discriminating Agricultural Land Cover in Portions of Northern Mindanao, Philippines**  
Jigg Lomarda Pelayo, CMU Phil-LiDAR 2.B.11, Philippines

**11:42 Analysing relationships between urban land use fragmentation metrics and socio-economic variables**  
Marta Sapena, Polytechnic University of Valencia, Spain

## 18/7 10:30 - 12:00 VIII/9 - Coastal and Ocean Applications 2

Session Chair: Samantha Jane Lavender, Pixalytics Ltd

Session Co-Chair: Bharat Lohani, IIT Kanpur

**10:30 Mapping of Coral Reef Environment In the Arabian Gulf Using Multispectral Remote Sensing**  
Prashanth Reddy Marpu, Masdar Institute, United Arab Emirates

**10:48 An object-based workflow developed to extract aquaculture ponds from airborne LiDAR data: A test case in Central Visayas, Philippines**  
Regine Añora Loberternos, University of San Carlos, Philippines

**11:06 Mapping of seagrass cover along mediterranean coast of turkey using landsat 8 oli images**

Tolga Bakirman, Yildiz Technical University, Turkey

**11:24 Random forest classification of sediments on exposed intertidal flats using ALOS-2 quad-polarimetric SAR data**  
Wensheng Wang, University of Chinese Academy of Sciences, China

**11:42 Estimating the Amount of Ship Recycling Activity Using Remote Sensing Application**  
Masanori Watagawa, Pasco corp., Japan

## 18/7 13:30 - 15:00 I/Va - Mobile Scanning and Imaging Systems for 3D Surveying and Mapping 2

Session Chair: Antonio Tommaselli, Unesp  
Session Co-Chair: Adilson Berveglieri, São Paulo State University - UNESP

**13:30 Pole Photogrammetry with an Action Camera for Fast and Accurate Surface Mapping**  
Jose Alberto Gonçalves, University of Porto, Portugal

**13:48 Photogrammetric reconstruction with Bayesian information**  
Andrea Masiero, University of Padova, Italy

**14:06 Advanced tie feature matching for the registration of mobile mapping imaging data and aerial imagery**  
Phillipp Jende, University of Twente, ITC, the Netherlands

**14:24 Enhanced RGB-D mapping method for detailed 3D modeling of large indoor environment**  
Shengjun Tang, Wuhan University, China; The Hong Kong Polytechnic University, China

**14:42 Automatic Feature Detection, Description and Matching from Mobile Laser Scanning Data and Aerial Imagery**  
Zille Hussnain, ITC, University of Twente, the Netherlands

## 18/7 13:30 - 15:00 V/2 - Cultural Heritage Data Acquisition and Processing

Session Chair: Francesco Nex, University of Twente - ITC Faculty  
Session Co-Chair: Klara Ambrozova, VUGTK, v.v.i.



**13:30 A Radical Collaborative Approach: Developing a Model for Learning Theory, Human-Based Computation and Participant Motivation in a Rock-Art Heritage Application**

Robert Alexander Haubt, Griffith University, Australia

**13:48 Adaptation of industrial hyperspectral line scanner for archaeological applications**

Vanja Miljković, Faculty for Geodesy, Croatia

**14:06 Automatic Damage Detection for Sensitive Cultural Heritage Sites**

Daniele Cerra, DLR, Germany

**14:24 Sfm technique and focus stacking for digital documentation of archaeological artifacts**

Ludovico Ruggeri, Dica Univpm Marche, Italy

**18/7 13:30 - 15:00 VII/6 - Remote Sensing Data Fusion 4**

Session Chair: John L. van Genderen, ITC

Session Co-Chair: Yu Zeng, Chinese academy of surveying and mapping

**13:30 Enhancement of spatial resolution of the LROC Wide Angle Camera images**

Prasun Mahanti, Arizona State University, United States of America

**13:48 Hyperspectral transformation from EO-1 ALI imagery using Pseudo-Hyperspectral Image Synthesis Algorithm**

Nguyen Tien Hoang, Kyoto University, Japan; Hue University, Vietnam

**14:06 Mapping of high value crops through an object-based SVM model using LiDAR data and orthophoto in Agusan del Norte Philippines**

Rudolph Joshua Candare, Phil-LiDAR 2 Caraga State University, Philippines

**14:24 The Effect of Pansharpening Algorithms on the Resulting Orthoimagery**

Panagiotis Agrafiotis, National Technical University of Athens, Greece

**18/7 13:30 - 15:00 VIII/7 - Forestry, Natural Ecosystems & Biodiversity 5**

Session Chair: Balázs Székely, Loránd Eötvös University, Budapest

Session Co-Chair: Indranil Mondal, Wildlife Institute of India

**13:30 TLS field data based intensity correction for forest environments**

Johannes Heinzel, WSL Swiss Federal Institute for Forest, Snow and Landscape Research, Switzerland

**13:48 Estimating dbh of trees employing multiple linear regression of the best lidar-derived parameter combination automated in python in a natural broadleaf forest in the philippines**

Carlyn Ann Gonzales Ibanez, UP Training Center for Applied Geodesy and Photogrammetry, Philippines

**14:06 Vegetation disturbance and recovery following a rare windthrow event in the Great Smoky Mountains National Park**

Marguerite Madden, University of Georgia, United States of America

**14:24 Mapping and change analysis in mangrove forest by using landsat imagery**

Dan Thanh Tran, Nagasaki University, Japan; National Central University, Taiwan

**18/7 13:30 - 15:00 VIII/8 - Land Cover and its Dynamics, Including Agricultural & Urban Land Use 6**

Session Chair: Suryakant Ashok Sawant, Indian Institute of Technology Bombay

Session Co-Chair: Václav Ždímal, Mendel University in Brno

**13:30 Landscapes impacted by light**

Blanca Arellano, Technical University of Catalonia, Spain

**13:48 Forest stress analysis in Hong Kong's forested area using satellite-based fluorescence**

Syed M. Irteza, Hong Kong Polytechnic University, China

**14:06 Comprehensive evaluation of urban sprawl on ecological environment using multi-source data: a case study of Beijing**

Hao Wang, Chinese Academy of Surveying and Mapping, China

**14:24 Analysis of relationship between urban heat island effect and land use/cover**

type using landsat 7 etm+ and landsat 8 oli images

Nagihan Aslan, Akdeniz University, Turkey

**14:42 Monitoring land cover dynamics at varying spatial scales using high to very high resolution optical imagery**

Samantha Jane Lavender, Pixalytics Ltd, United Kingdom

**18/7 13:30 - 15:00 VIII/SpS 7 - GEO: Earth Observation and Societal Benefits: Global issues and best practices**

Session Chair: Barbara Ryan

Session Co-Chair: Petros Patias, The Aristotle University

**13:30 Addressing societal challenges through Earth observation: contribution and opportunities arising from Horizon 2020, the EU Framework Programme for research and innovation**

Michel Schouppe, European Commission, Directorate-General for Research and Innovation, Belgium

**13:48 The european network for observing our changing planet: the ERA-PLANET project**

Nicola Pirrone, CNR-Institute of Atmospheric Pollution Research, Italy

**14:24 The Benefits and Challenges Having an Open and Free Basis Satellite Data Sharing Platform in Turkey: Gezgin**

Husne Seda Deveci, TUBITAK UZAY, Turkey

**14:42 Earth observations to inform decision-making for the benefit of society.**

Barbara Ryan, GEO Secretariat, Switzerland

**18/7 13:30 - 15:00 VII/ThS 5 - 3D information extraction from SAR imagery + VII/ThS 4 - TanDEM-X**

Session Chair: Mattia Crespi, University of Rome La Sapienza

Session Co-Chair: Batuhan Osmanoglu, USRA - NASA Goddard Space Flight Center

**13:30 Towards a Semantic Interpretation of Urban Areas With Airborne Synthetic Aperture Radar Tomography**

Olivier D'Hondt, Technische Universität Berlin, Germany

**13:48 Upgrade of FOSS DATE plug-in: implementation of a new radargrammetric DSMs generation capability**

Martina Di Rita, "La Sapienza" University of Rome, Italy

**14:06 Potential of multitemporal TanDEM-X derived crop surface models for maize growth monitoring**

Christoph Hütt, University of Cologne, Germany

**14:24 A new high-resolution elevation model of Greenland derived from TanDEM-X**

Birgit Wessel, German Aerospace Center (DLR), Germany

**14:42 Analysis of TanDEM-X data to extract high resolution-high accuracy DEM and mangrove canopy height**

Batuhan Osmanoglu, Biospheric Sciences Laboratory; NASA Goddard Space Flight Center, USA

**18/7 15:00 - 16:30 Interactive session**

**(I/4, I/Va, VI/6, VII/1, VII/3, VII/6, VII/7, VIII/7, VIII/9, ThS18, SpS8)**

**WG I/4 - Geometric and Radiometric Modeling of Optical Airborne and Spaceborne Sensors**

**Towards Fast Morphological Mosaicking of High-Resolution Multi-Spectral Products – On Improvements of Seamlines**

Thomas Krauß, German Aerospace Center (DLR), Germany

**A detail study about digital surface model generation using high resolution satellite stereo imagery**

Ke Gong, University of Stuttgart, Germany

**Radiometric and Geometric Accuracy Analysis of RASAT Imagery**

Sultan Kocaman, Hacettepe University, Turkey

**Self-calibration of space linear array camera**

Wei Liu, Xi'an Surveying and Mapping Institute, China

**Estimation of the atmospheric refraction effect in airborne images using**

**radiosonde data**

*Ulrich Beisl, Leica Geosystems, Switzerland*

**Airborne linear array image geometric rectification method based on unequal segmentation**

*Mei Zhou, Academy of Opto-Electronics, CAS, China*

**Automatic texture reconstruction of 3d city model from oblique images**

*Junhua Kang, Wuhan University, China*

**Low Frequency Error Analysis And Calibration For High-resolution Optical Satellite's Uncontrolled Geometric Positioning**

*Chengcheng Fan, Wuhan University, China*

**Radiometric Cross-calibration of KOMPSAT-3A with Landsat-8**

*Dongyoon Shin, Pukyong National University, Korea*

**Anisotropic Scattering Shadow Compensation Method for Remote Sensing Image with Consideration of Terrain**

*Qiongjie Wang, Wuhan University, China*

**Accuracy Comparison of VHR Systematic-ortho Satellite Imageries Against VHR Orthorectified Imageries Using GCP**

*Jali Octariady, Geospatial Information Agency, Indonesia*

**Research on reef bathymetric survey of UAV stereopair based on two-medium photogrammetry**

*Dongmei Ye, ZJtoprs, China*

**I/Va - Mobile Scanning and Imaging Systems for 3D Surveying and Mapping**

**Post-Mission Quality Assurance Procedure for Survey-Grade Mobile Mapping Systems**

*Ana Paula Kersting, Teledyne Optech, Canada*

**Robust Parallel Motion Estimation and Mapping with Stereo Cameras in Underground Infrastructures**

*Zhengning Li, Tongji University, China*

**Accuracy assessment of mobile mapping point clouds using the existing environment as terrestrial reference**

*Sabine Hofmann, Leibniz Universität Hannover, Germany*

**A fast method for measuring the similarity between 3D model and 3D point cloud**

*Jonathan Li, Xiamen University, China; University of Waterloo, Canada*

**Image capture with synchronized multiple-cameras for extraction of accurate geometries**

*Mathieu Koehl, INSA de Strasbourg, France*

**Road Signs Detection and Recognition Utilizing Images and 3D Point Cloud Acquired by Mobile Mapping System**

*Yong He Li, PASCO, Japan*

**Detection and Characterization of Cracks in Paved Road Surface Using Laser Scan Image Data**

*Jaeyoung Choi, PASCO Corporation, Japan*

**Comparative evaluation of kernel-based techniques for pavement crack detection in asphalt road images**

*Michael Hahn, University of Applied Sciences Stuttgart, Germany*

**Evaluation of driver visibility from mobile LiDAR data and weather conditions**

*Higinio González-Jorge, Universidad de Vigo, Spain*

**3D feature point extraction from LiDAR data using a neural network**

*Yu Feng, Leibniz Universität Hannover, Germany*

**Systematic Calibration for A Spherical Photogrammetry Imaging System**

*Giann-Yeou Rau, National Cheng Kung University, Taiwan*

**Disaster Prevention Coastal Map Production by MMS & C3D**

*Shuhei HATAKE, Asia Air Survey; Arc Geo Support, Japan*

**Automatic adjustment of wide-base google street view panoramas**

*Vassilis Tsironis, National Technical University of Athens, Greece*



**A method of generating panoramic street strip image map with mobile mapping system**

*Tianen CHEN, PASCO Corporation, Japan*

**Automatic Shape-Based Target Extraction for Close-Range Photogrammetry**

*Yiping Chen, Xiamen University, China*

**A new automatic system calibration of multi-cameras and LIDAR sensors**

*Mohamed Fawzy Hassanein, University of Calgary, Canada*

**Initial tests and accuracy assesment of a compact mobile laser scanning system**

*Kalev Julge, Tallinn University of Technology, Estonia*

**VII/6 - Technology Transfer and Capacity Development**

**Designing Zoning of Remote Sensing Drones for Urban Applications: A Review**

*Norzailawati Mohd Noor, International Islamic University of Malaysia, Malaysia*

**RS-based water resource inventory of the Philippines: capacity building efforts for nationwide implementation**

*Anjillyn Mae C. Perez, University of the Philippines - Diliman, Philippines*

**National natural resource inventory of the Philippines using LiDAR: strategies, progress, and challenges**

*Ariel Conferido Blanco, University of the Philippines Diliman, Philippines*

**VII/1 - Physical Modelling and Signatures in Remote Sensing**

**Bidirectional Reflectance Modeling of the Geostationary Sensor Himawari-8/AHI Using a Kernel-Driven BRDF Model**

*Masayuki Matsuoka, Faculty of Agriculture, Kochi University, Japan*

**Soil Salinity Mapping Using Multitemporal Landsat Data**

*Anali Azabdaftari, Istanbul Technical University, Turkey*

**Kernel Feature Cross-Correlation for Unsupervised Quantification of Damage from Windthrow in Forests**

*Francesco Pirotti, University of Padova, Italy*

**Image quality assessment for VHSR Remote Sensing Image Classification**

*Zhipeng Li, Southwest Jiaotong University, China*

**VII/3 - Information Extraction from Hyperspectral Data**

**Cirrus Removal in Multispectral Data without 1.38 $\mu$ m Spectral Data**

*Aliaksei Makarau, German Aerospace Center (DLR), Germany*

**Band Selection for Urban Materials Classification**

*Arnaud Le Bris, IGN France, France*

**A simple interpretation of the rice spectral indices space for assessment of heavy metal stress**

*Ping Wang, Northeast Normal University, China*

**Bathymetry Mapping Using Hyperspectral Data: A Case Study of Yamada Bay, Northeast Japan**

*Emiko Ariyasu, Asia Air Survey Co., Ltd, Japan*

**Target detection**

*Maliheh Jafari Houdki, Shahid Bahonar University of Kerman, Iran*

**Feature Analysis for Quantitative Estimation of Cyanobacteria Chlorophyll-A**

*Yi Lin, College of Surveying and Geoinformatics, Tongji University, China*

**A study of the impact of insolation on remote sensing-based landcover and landuse data extraction**

*Kazimierz Becek, Wroclaw University of Technology, Poland*

**Estimation of leaf area index using an angular vegetation index based on in situ measurements and CHRIS/PROBA data**

*Lijuan Wang, JIangsu normal university, China*

**Mineralogical Mapping in a Part of a Gold Prospect Using EO-1 Hyperion Data**

*Vivek Kumar Sengar, Indian Institute of Remote Sensing, India*

#### VII/6 - Remote Sensing Data Fusion

**Geospatial analysis of near surface soil moisture time series data over Indian region**

*Preeti Berwal, Haryana Space Application Centre, India*

**A comparison of lidar reflectance and radiometrically calibrated hyperspectral imagery**

*Andreas Roncat, TU Wien, Austria*

**Comprehensive spectral signal investigation of larch trees combining ground and satellite-based measurements**

*Johannes Marian Landmann, University of Innsbruck, Austria*

**Remote sensing image fusion using ICA and optimization wavelet transform**

*Volodymyr Volodymyrovich Hnatushenko, Oles Honchar Dnipropetrovsk National University; EOS Data Analytics, Ukraine*

**Research on the construction method of comprehensive evaluation index of geographic conditions**

*Zhi Hua Zhang, Qingdao Geotechnical Investigation and Surveying Institute, China*

**Robust evaluation of high performance pansharpening algorithms on modern satellite imagery**

*Aristides Vaiopoulos, NTUA, Greece*

**Differential search algorithm based image fusion and edge detection**

*Mehmet Akif Günen, Erciyes Univesity, Turkey*

#### VII/7 - Synergy in Radar and LiDAR

**Analysis of Scattering Components from Fully Polarimetric SAR Images for Improving Accuracies of Urban Density Estimation**

*Junichi Susaki, Kyoto University, Japan*

**Extraction of Coastlines with Fuzzy Approach Using Sentinel-1 SAR Image**

*Nusret Demir, Akdeniz University, Turkey*

**Model Accuracy Comparison for High Resolution InSAR Coherence Statistics over Urban Areas**

*Yue Zhang, University of Chinese Academy*

*of Sciences, China*

#### VIII/7 - Forestry, Natural Ecosystems & Biodiversity

**Estimating carbon stock changes of mangrove forests using satellite imagery and airborne LiDAR data in the South Sumatra state, Indonesia**

*Yoshiko Maeda, Kokusai Kogyo Co., Ltd, Japan*

**Mangrove plantation forest assessment using structural attributes derived from light detection and ranging (lidar) data**

*Regine Anne Gepa Faelga, Phil-LiDAR; Nationwide Detailed Resources Assessment Using LiDAR, Philippines*

**Light diffusion in a Tropical Dry Forest**

*Sofia Calvo-Rodriguez, University of Alberta, Canada*

**Spatiotemporal analysis for wildlife-vehicle-collisions based on accident statistics of the county Straubing-Bogen in Lower Bavaria**

*Raphaela Pagany, Deggendorf Institute of Technology, Germany*

**Estimation of stand height and forest volume using digital stereo photography and forest type map**

*Kyoung Min Kim, National Institute of Forest Science, Korea*

**Forest Tree Species Distribution Mapping Using Landsat Satellite Imagery and Topographic Variables with the Maximum Entropy Method in Mongolia**

*Shou-Hao Chiang, National Central University, Taiwan*

**Derivation of forest inventory parameters for carbon estimation using terrestrial lidar data**

*Om Prakash Prasad Kalwar, Tribhuvan University, Nepal*

**Exploring the Connectivity of Ecological Corridors between Low Elevation Mountains and Pingtung Linhousilin Forest Park of Taiwan by Least-Cost Path Method**

*Ya-Li Huang, National Pingtung University of Science and Technology, Taiwan*

**Individual tree crown delineation from a lidar derived canopy height model using the slope and curvature method in a coniferous plantation**

*Reginald Jay Labadisos Argamosa, Phil LIDAR 2, Philippines*

**Automatic Extraction of Mangrove Vegetation from Optical Satellite Data**

*Mayank Agrawal, International Institute of Information Technology, India*

**Wide-area mapping of forests with national airborne laser scanning and field inventory datasets**

*Jean-Matthieu Monnet, Irstea, France*

**Evaluation of forest canopy and understory gap fraction derived from terrestrial laser scanning**

*Kuei-Chia Chen, National Cheng Kung University, Taiwan*

**Assessing geographical isolation of the Galapagos Islands**

*Daniel Orellana, Universidad de Cuenca; Fundación Charles Darwin, Ecuador*

**Assessment of Fire Severity and Post-Fire Regeneration Based on Topographical Features Using Multitemporal Landsat Imagery: A Case Study in Mersin, Turkey**

*Hasan Tonbul, Gebze Technical University, Turkey*

**Algorithm for the automatic estimation of agricultural tree geometric parameters using airborne laser scanning data**

*Edyta Hadaś, Wrocław University of Environmental and Life Sciences, Poland*

**Vegetation cover mapping based on remote sensing and digital elevation model data**

*Irina Danilova, Sukachev Institute of Forest Siberian Branch RAS, Russian Federation*

**An optional threshold with SVM cloud detection algorithm and DSP implementation**

*Guoqing Zhou, Guilin University of Technology, China*

**Object-Based Forest Cover Monitoring Using High Resolution Satellite Images**

*Shiming Li, Chinese Academy of Forestry, China*

**GIS Based Tool for Seeds Material Collection and Propagation**

*Krzysztof Stereńczak, Forest Research Institute, Poland*

**Mapping disturbance dynamics in wet sclerophyll forest using an opensource approach**

*Andrew Haywood, European Forest Institute, Malaysia*

### VIII/9 - Coastal and Ocean Applications

**Coastline extraction from aerial images based on edge detection**

*Lemonia Ragia, Technical University of Crete, Greece*

**Large oil spill classification using SAR images based on spatial histogram**

*Dan G. Blumberg, Ben-Gurion University of the Negev, Israel*

**Calibration/validation of Landsat-derived ocean color products in Boston Harbor**

*Nima Pahlevan, NASA Goddard Space Flight Center, USA*

**Detection of Coastline Deformation Using Remote Sensing and Geodetic Surveys**

*Asli Sabuncu, Bogazici University, Turkey*

**Spatial changes and population movements on the Albanian coastline**

*Ursa Kanjir, ZRC SAZU, Slovenia*

**Applying UAS and photogrammetry to monitor the morphological changes along the beach in Penghu islands**

*Cheng-Hao Lu, National Penghu University of Science and Technology, Taiwan*

**Contribution of satellite altimetry data in geological structure research in the South China Sea**

*Dung Tuan Tran, Vietnam Academy of Science and Technology, Vietnam*

**Costal bathymetry estimation from multispectral image with back propagation neural network**

*Hsuan Ren, National Central University, Taiwan*



**Feasibility Study of Landsat-8 Imagery for Retrieving Sea Surface Temperature (Case Study Persian Gulf)**

*Mahdi Hasanlou, University of Tehran, Iran*

**Ocean Color Retrieval Using Landsat-8 Imagery in Coastal Case 2 Waters (Case Study Persian and Oman Gulf)**

*Mahdi Hasanlou, University of Tehran, Iran*

**Oil spill detection and monitoring of Abu Dhabi coastal zone using kompsat-5 SAR imagery**

*Hussein Harahsheh, Global Scan Technologies, United Arab Emirates*

**ThS 18 - GlobeLand30**

**A knowledge-based approach on Globeland30 incremental updating: a case study of built-up area**

*Jun Zhang, National Geomatics Center of China, China*

**High resolution Aerosol Optical Depth mapping of Beijing using Landsat8 imagery**

*Yan Li, Nanjing University, China*

**SpS 8 - SSUGIT: Russian session - Advances in PH&RS&SIS in Russia**

**On the Issues Legal and Technical Regulation of Geodetic, Cartographic and Spatial Data in the Russian Federation**

*Alexander N. Prusakov, Federal Scientific-Technical Center of Geodesy, Cartography and Spatial Data Infrastructure, Russian Federation*

**Use of Aerospace Methods – Basis for Improving of State Mapping**

*Sergey S. Nekhin, Federal Scientific-Technical Center of Geodesy, Cartography and Spatial Data Infrastructure, Russian Federation*

**18/7 16:30 - 18:00 I/Va - Mobile Scanning and Imaging Systems for 3D Surveying and Mapping 3**

Session Chair: Kai-Wei Chiang, National Cheng Kung University

Session Co-Chair: Stephan Nebiker, FHNW University of Applied Sciences and Arts Northwestern Switzerland

**16:30 A feasibility study on use of generic MLS system for detecting asphalt pavement cracks in Ontario, Canada**

*Jonathan Li, University of Waterloo, Canada*

**16:48 Pole-like object extraction from mobile LiDAR data**

*Han Zheng, University of Calgary, Canada*

**17:06 Lidar-incorporated Traffic Sign Detection from video log images of Mobile Mapping System**

*Ying Li, Wuhan University, China*

**17:24 Tunnel Point Cloud Filtering Method Based on Elliptic Cylindrical Model**

*Ning-ning Zhu, WuHan University, China*

**17:42 Comparison of ZEB1 and Leica C10 Indoor Laser Scanning Point Clouds**

*Beril Sirmacek, Delft University of Technology, the Netherlands*

**18/7 16:30 - 18:00 V/5 - Close-range Measurements for Biomedical Sciences and Geosciences 4**

Session Chair: Thomas Dewez, BRGM French Geological Survey

**16:30 Cliff collapse hazard from repeated multicopter UAV acquisitions: return on experience**

*Thomas J.B. Dewez, BRGM French Geological Survey, France*

**16:48 Accuracy assessment of underwater photogrammetric three dimensional modeling for coral reefs**

*Tao Guo, ETH Zurich Swiss Federal Institute of Technology, Switzerland*

**17:06 Monitoring and Deformation Analysis of Groynes Using Terrestrial Laser Scanning at the River Elbe**

*Felix Tschirschwitz, HafenCity University Hamburg, Germany*

**17:24 Automatic waterline extraction from smartphone images**

*Melanie Kröhnert, TU Dresden, Germany*

**18/7 16:30 - 18:00 VII/3 - Information Extraction from Hyperspectral Data 2: Hyperspectral applications from Mars to Earth**

Session Chair: Bogdan Zagajewski, EARSeL  
Session Co-Chair: Jan Hanuš, UVGZ AV ČR  
- CzechGlobe

**16:30 Leaf area index retrieved from thermal hyperspectral data**

Elnaz Neinavaz, University of Twente, the Netherlands

**16:48 IR spectral mapping of the martian south polar residual cap using CRISM**

Jacqueline Campbell, University of Brighton, United Kingdom

**17:06 Hyperspectral anomaly detection in urban scenarios**

Juan Gregorio Rejas, Technical University of Madrid, Spain

**17:24 Comparing broad-band and red edge-based spectral vegetation indices to estimate nitrogen concentration of crops using CASI data**

Guijun Yang, Beijing Academy of Agriculture and Forestry Sciences, China

**18/7 16:30 - 18:00 VII/4 - Methods for Image Classification 8**

Session Chair: Ahmed Shaker, Ryerson University

Session Co-Chair: Haruhisa Shimoda, Tokai University

**16:30 Comparison of filters dedicated to speckle suppression from SAR images**

Przemysław Kupidura, Warsaw University of Technology, Poland

**16:48 An object-based method for Chinese landform types classification**

Wufan Zhao, Nanjing Normal University, China

**17:06 Testing of land cover classification from multispectral airborne laser scanning data**

Krzysztof Bakula, Warsaw University of Technology, Poland

**17:24 VHR aerial images classification using invariant color components and multi scale texture**

Alessia Movia, University of Udine, Italy

**17:42 Combining spectral and texture features using random forests: extracting impervious surface area in Wuhan**

Zhenfeng Shao, Wuhan University, China

**18/7 16:30 - 18:00 VIII/7 - Forestry, Natural Ecosystems & Biodiversity 6**

Session Chair: Johannes Heinzel

Session Co-Chair: Dan Thanh Tran, Nagasaki University

**16:30 Evaluation of vertical lacunarity profiles in forested areas using Airborne Laser Scanning point clouds**

Balázs Székely, Loránd Eötvös University, Hungary; TU Bergakademie Freiberg, Germany; Vienna University of Technology, Austria

**16:48 Modelling fine scale movement corridors for the Tricarinate Hill Turtle**

Indranil Mondal, Wildlife Institute of India, India

**17:06 Impacts of tree height-dbh allometry on lidar-based tree aboveground biomass modeling**

Rong Fang, Oregon State University, USA

**17:24 Comparison of very near infrared (VNIR) wavelength from EO-1 Hyperion and Worldview-2 images for saltmarsh classification**

Sidkar Mohammad Marnes Rasel, Macquarie University, Australia

**18/7 16:30 - 18:00 VIII/8 - Land Cover and its Dynamics, Including Agricultural & Urban Land Use 7**

Session Chair: Blanca Arellano, Technical University of Catalonia

Session Co-Chair: Nagihan ASLAN, Akdeniz university

**16:30 Forestry Expansion during the Last Decades in the Paraíba Do Sul Basin - Brazil**

Felix Carriello, Universidade Federal Fluminense, Brazil

**16:48 The combination of UAV survey and LANDSAT imagery for monitoring of crop vigor in precision agriculture**

Vojtech Lukas, Mendel University in Brno, Czech Republic

**17:06 Time series analysis of remote sensing observations for citrus crop growth stage and evapotranspiration estimation**

Suryakant Sawant, Indian Institute of  
Technology Bombay, India

**17:24** Changes in Scattered Greenery in  
Selected Area in the Czech Republic from  
1853 to 2014

Václav Ždímal, Mendel University in Brno,  
Czech Republic

**17:42** Geotechnologies for the  
Characterization of Specialty Coffee  
Environments of Mantiqueira De Minas in  
Brazil

Helena Maria Ramos Alves, EMBRAPA, Brazil

**18/7 16:30 - 18:00 VIII/SpS 15 - URSI:**  
**Disaster and Risk Management**

Session Chair: Tullio Joseph Tanzi, Institut  
Mines-Telecom - Telecom ParisTech

Session Co-Chair: Ralph Kiefl, German  
Aerospace Center (DLR)

**16:30** Using airborne remote sensing to  
increase situational awareness in civil  
protection and humanitarian relief - the  
importance of user involvement

Kiefl Ralph, German Aerospace Center (DLR),  
Germany

**16:48** Towards “drone-borne” disaster  
management

Madhu Chandra, Chemnitz University of  
Technology, Germany

**17:06** Rapid Exposure Assessment of  
Nationwide River Flood for Disaster Risk  
Reduction

Youngjoo Kwak, ICHARM-UNESCO-PWRI,  
Japan



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An aerial night photograph of a city, likely Prague, showing a dense cluster of historic buildings with ornate, copper-clad domes and spires. A prominent stone clock tower with a large clock face is visible on the left. In the background, modern glass skyscrapers are illuminated against the dark blue twilight sky. The foreground shows a street with trees and warm streetlights.

11

PROGRAM XXIII ISPRS  
TUESDAY 19 JULY

## Tuesday, 19 July, 2016

TIME	LOCATION	SESSION
08:30 - 10:00	Club H	I/5 - Satellite Systems for Earth Observation 2
	Club E	I/Va - Mobile Scanning and Imaging Systems for 3D Surveying and Mapping 4
	Club A	V/5 - Close-range Measurements for Biomedical Sciences and Geosciences 5
	Club B	VI/SpS8 - SSUGIT: Russian session - Advances in PH&RS&SIS in Russia 1
	Club C	VII/SpS 10 - FOSS4G: FOSS4G Session (coorganized with OSGeo) 1
	Club D	VIII/SpS 17 - GEO: Earth Observation from Global Land to Urban Systems
10:30 - 12:00	Club B	VI/SpS 8 - SSUGIT: Russian session - Advances in PH&RS&SIS in Russia 2
	Club C	VII/5 - Methods for Change Detection and Process Modelling 4
	Club A	VII/SpS 10 - FOSS4G: FOSS4G Session (coorganized with OSGeo) 2
	Club D	VIII/ThS 18 - GlobeLand30
13:30 - 15:30	Congress Hall	Closing Ceremony



## Tuesday 19 July 2016

### **19/7 08:30 - 10:00 I/5 - Satellite Systems for Earth Observation 2**

Session Chair: Ralf Reulke, Humboldt-Universität zu Berlin  
Session Co-Chair: Mi Wang, Wuhan University

**08:30** A study of the impact of vegetation on radar backscatter on multilayer multiscale rough surfaces.

Ibtissem Hosni, ENIT, Tunisia

**08:48** Automated FORMOSAT image processing system for rapid response to international disasters

Ming-Chih Cheng, National Space Organization, Taiwan

**09:06** Beidou singal-in-space anomalies in the last three years

Yun Wu, School of Geodesy and Geomatics, China

**09:24** Tsunami lead wave reconstruction based on noisy sea surface height measurements

Kegen Yu, Wuhan University, China

### **19/7 08:30 - 10:00 I/Va - Mobile Scanning and Imaging Systems for 3D Surveying and Mapping 4**

Session Chair: Alberto Guarnieri, University of Padova

Session Co-Chair: Bisheng Yang, Wuhan University

**08:30** A systematic comparison of direct and image-based georeferencing in challenging urban areas

Stefan Cavegn, FHNW University of Applied Sciences and Arts Northwestern Switzerland, Switzerland

**08:48** A Method for the positioning and orientation of rail-bound vehicles in GNSS-free environments

Raymond Hung, The Hong Kong Polytechnic University, China

**09:06** Vehicle localization by LiDAR point correlation improved by change detection

Alexander Schlichting, Leibniz Universität

Hannover, Germany

**09:24** The Performance of a Tight INS/GNSS/Photogrammetric Integration Scheme for Land Based MMS Applications in GNSS Denied Environments

Chu Chien-Hsun, National Cheng Kung University, Taiwan

**09:42** A light-weight laser scanner for UAV applications

Antonio Tommaselli, Univ Estadual Paulista, Brazil

### **19/7 08:30 - 10:00 V/5 - Close-range Measurements for Biomedical Sciences and Geosciences 5**

Session Chair: Thomas Dewez, BRGM French Geological Survey

**08:30** Close Range Digital Photogrammetry Applied to Topography and Landslide Measurements

Wen-Cheng Liu, National United University, Taiwan

**08:48** 3D Central Line Extraction of Fossil Oyster Shells

Ana Djuricic, Vienna University of Technology, Austria

**09:06** FACETS : a CloudCompare plugin to extract geological planes from unstructured 3D point clouds

Thomas J.B. Dewe, BRGM French Geological Survey, France

**09:24** An automatic algorithm for minimizing anomalies and discrepancies in point clouds acquired by laser scanning technique

Fabiane Bordin, University of Vale do Rio dos Sinos, Brazil

**09:42** Brute force matching from real images to synthetic images from point clouds

Richard Boerner, Technische Universität Dresden, Germany

### **19/7 08:30 - 10:00 VI/SpS8 - SSUGIT: Russian session - Advances in PH&RS&SIS in Russia 1**

Session Chair: Alexander Karpik

Session Co-Chair: Leonard Yablonskiy, Center of Geodesy, Cartography and SDI



## **8:30 Research and practical trends in geospatial sciences**

Igor A. Musikhin, Siberian State University of Geosystems and Technologies, Russian Federation

## **08:48 Models for photogrammetric processing of information from “Resource-P” satellites**

Aleksey Evgenyevich Kuznetsov, Ryazan State Radio Engineering University, Russian Federation

## **09:06 Application Satellite Data Terra-MODIS to Environmental Monitoring in Western Siberia**

Tatiana Olegovna Peremitina, Russian Academy of Sciences, Russian Federation

## **09:24 Algorithms for relative radiometric correction in Earth observing systems “Resource-P” and “Canopus-V”**

Viktor Alekseevich Zenin, Ryazan State Radio Engineering University, Russian Federation

## **09:42 Monitoring of the undermined territories of Karaganda coal basin on the basis of satellite radar interferometry**

Svetlana Ozhigina, Karaganda state technical university, Kazakhstan

## **10:00 Mesoscale Diffractive Photonics in Geosciences**

Igor V. Minin, Siberian State University of Geosystems and Technologies, Russian Federation

## **19/7 08:30 - 10:00 VII/SpS 10 - FOSS4G: FOSS4G Session (coorganized with OSGeo) 1**

Session Chair: Maria Antonia Brovelli, Politecnico di Milano

Session Co-Chair: Helena Mitasova, North Carolina State University

## **08:30 Open source approach to urban growth simulation**

Anna Petrasova, NCSU, USA

## **08:48 A plugin to interface openModeller from QGIS for species’ potential distribution modelling**

Daniel Becker, University of Cologne, Germany

## **09:06 Harvesting, integrating and distributing large Open Geospatial Datasets using Open-Source Software**

Ricardo Oliveira, University of Colorado at Denver, USA

## **09:24 Development of Open source-based Automatic shooting and processing UAS imagery for Orthoimage Using Smart Camera UAV.**

Jinwoo Park, Pukyong National University, Korea

## **09:42 Geospatial data stream processing in python using foss4g components**

Graeme Andrew McFerren, CSIR, South Africa

## **19/7 08:30 - 10:00 VIII/SpS 17 - GEO: Earth Observation from Global Land to Urban Systems**

Session Chair: Qihao Weng, Indiana State University

Session Co-Chair: Jamal Jokar Arsanjani, University of Heidelberg

## **08:30 Development of time-series human settlement mapping system using historical Landsat archive**

Hiroyuki Miyazaki, University of Tokyo, Japan

## **08:48 Towards consistent mapping of urban structures – Global Human Settlement Layer and Local Climate Zones**

Benjamin Bechtel, University of Hamburg, Germany

## **09:06 Earth Observation-Supported Service Platform for the Development and Provision of Thematic Information on the Built Environment – the TEP-Urban Project**

Jakub Balhar, German Aerospace Center, Germany

## **19/7 10:30 - 12:00 VI/SpS 8 - SSUGIT: Russian session - Advances in PH&RS&-SIS in Russia 2**

Session Chair: Alexander Karpik

Session Co-Chair: Leonard Yablonskiy, Center of Geodesy, Cartography and SDI

## **10:30 Prelaunch photogrammetric calibration of Russian satellite Elektro-L**

## imagery instruments

Andrey Mihaylovich Kochergin, Ryazan State Radio Engineering University, Russian Federation

### **10:48 UAV aerial survey: accuracy estimation for automatically generated dense digital surface model and orthophoto plan**

Maksim Aleksandrovich Altyntsev, Siberian State University of Geosystems and Technology, Russian Federation

### **11:06 Development of Mapping Applications for Mobile Devices**

Pavel Kikin, Siberian State University of Geosystems and Technologies, Russian Federation

### **11:24 English for specific purposes: teaching English for science and technology**

Igor Musikhin, Siberian State University of Geosystems and Technologies, Russian Federation

### **11:42 Research and technology development for construction of**

Tatyana Aleksandrovna Khlebnikova, Siberian State University of Geosystems and Technologies, Russian Federation

### **19/7 10:30 - 12:00 VII/5 - Methods for Change Detection and Process Modelling 4**

Session Chair: Shiran Havivi, Ben Gurion university of the Negev

Session Co-Chair: Sebastian Brocks, University of Cologne

### **10:30 A New Method for Determining the Deformation Monitorable Indicator of Point Cloud**

Wei Xuan, Wuhan University, China

### **10:48 Utilizing SAR and multispectral integrated data for emergency response**

Shiran Havivi, Ben-Gurion University of the Negev, Israel

### **11:06 Interactive change detection of high resolution remote sensing images based on active learning with gaussian processes**

Hui Ru, Wuhan University, China

### **11:24 Nationwide hybrid change detection of buildings**

Vojtěch Hron, Czech Technical University in Prague, Faculty of Civil Engineering, Czech Republic

### **19/7 10:30 - 12:00 VII/SpS 10 - FOSS4G: FOSS4G Session (coorganized with OSGeo) 2**

Session Chair: Rafael Moreno, University of Colorado Denver

Session Co-Chair: Helena Mitasova, North Carolina State University

### **10:30 An automated GRASS-based procedure to assess the geometrical accuracy of the OpenStreetMap Paris road network**

Marco Minghini, Politecnico di Milano, Italy

### **10:48 New implementation of OGC Web Processing Service in Python programming language. PyWPS-4 and issues we are facing with processing of large raster data using OGC WPS.**

Jachym Cepicky, OpenGeoLabs, Czech Republic

### **11:06 Processing UAV and lidar point clouds in GRASS GIS**

Vaclav Petras, North Carolina State University, USA

### **11:24 Land cover maps of Europe: a WebGIS platform**

Monia Elisa Molinari, Politecnico di Milano, Italy

### **11:42 Design of a free and open source data processing, archiving, and distribution subsystem for the ground receiving station of the Philippine scientific earth observation micro-satellite**

Romer Kristi Danduan Aranas, University of the Philippines, Philippines; Hokkaido University, Japan

### **19/7 10:30 - 12:00 VIII/ThS 18 - Globe-Land30**

Session Chair: Fuan Tsai, National Central University

Session Co-Chair: Kuo-Hsin (Steven) Tseng, National Central University

**10:30** Uncertainty assessment of  
GlobeLand30 land cover dataset over  
Central Asia

Bo Sun, Shenzhen Institutes of Advanced  
Technology, Chinese Academy of Sciences,  
China

**10:48** A Service Composition Method for  
Land Cover services based on Pragmatics  
Web

Hao Wu, Nation Geomatics Center of China,  
China

**11:06** Visual tools for crowd-sourcing data  
validation within the globeland30 geoportal  
Ekaterina Chuprikova, Technische Universität  
München, Germany

**11:24** Modeling the distribution of African  
Savanna Elephants in Kruger National Park:  
An application of multi-scale GlobeLand30  
data

Wenjing Xu, University of Georgia, USA

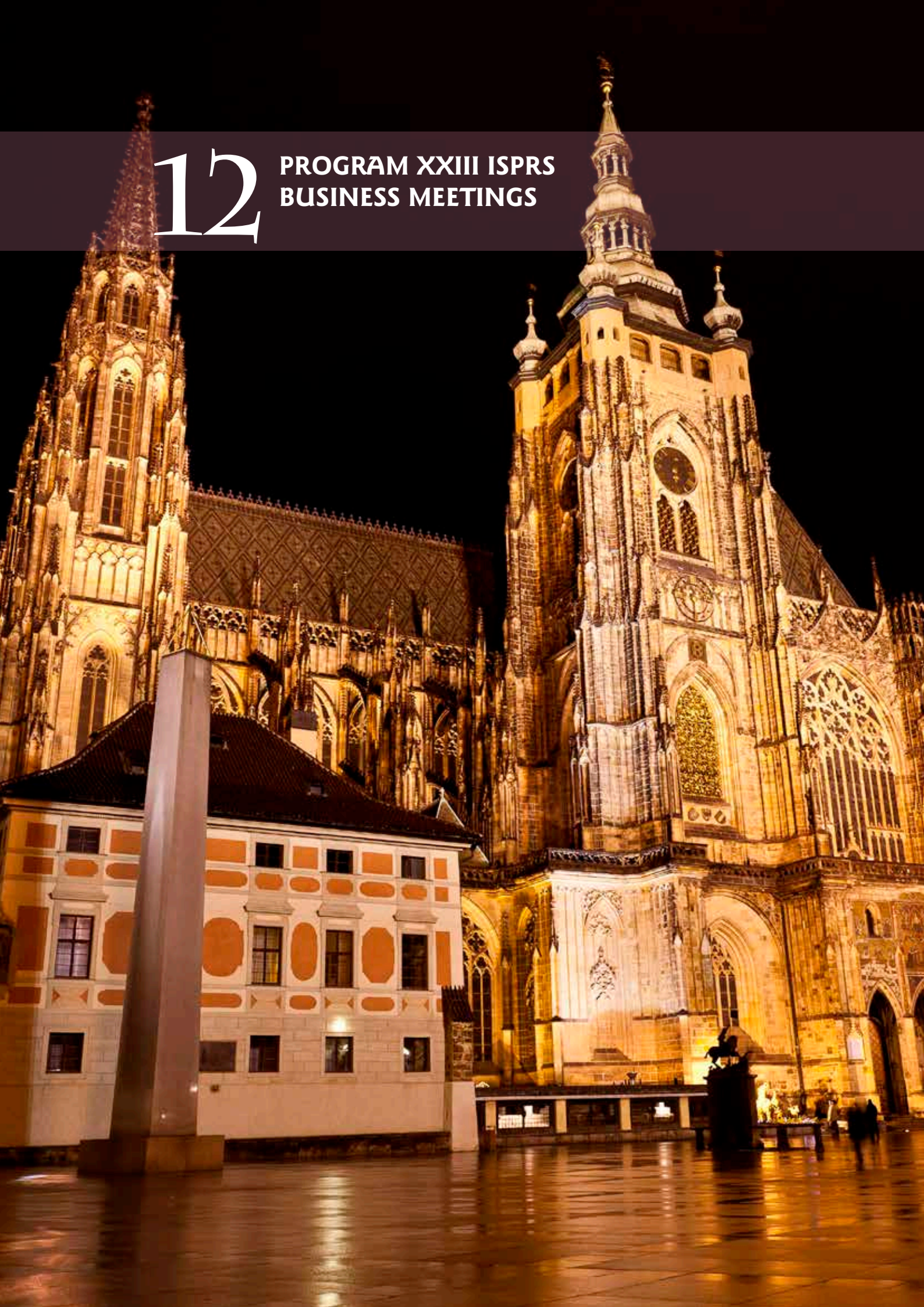
**11:42** Improving GlobalLand 30 Artificial type  
extraction accuracy in low-density residents

Ling Zhu, Beijing University of Civil  
Engineering and Architecture, China  
ISPRS 2016 Congress Scientific Program



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PROGRAM XXIII ISPRS  
BUSINESS MEETINGS



## BUSINESS MEETINGS

### Monday 11 July

**17:00 - 18:00 Meeting Hall II**

Council, outgoing TCPs

**18:00 - 19:00 Meeting Hall II**

Council, outgoing. TCPs, LOC

### Tuesday 12 July

**9:30 - 16:00 Forum Hall**

General Assembly

**16:30 - 18:30 Congress Hall**

Opening Ceremony

**18:30 - 19:00 Meeting Hall II**

Press Conference (only by invitation)

**19:00 - 21:00 Zoom restaurant**

Welcome Reception

### Wednesday 13 July

**8:30 - 10:10 Congress Hall**

Plenary Session I

**10:30 - 13:00 Meeting Hall II**

Joint Board of Geospatial Information Societies (only by invitation)

**12:00 - 14:00 Meeting Room 2.2**

ISAC

**12:30 - 13:30 Club D**

Meeting with StM

**13:00 - 13:30 Foyer**

Opening of the Technical Exhibition

**13:30 - 18:00 Forum Hall**

General Assembly

**14:00 - 16:00 Meeting Room 2.2**

IPAC

**15:30 - 17:00 Meeting Hall II**

IIAC

**18:00 - 19:30 Foyer**

Exhibitor Reception

### Thursday 14 July

**12:30 - 13:30 Club A**

Open Meeting 1 of Technical Commission TC I/I

**12:30 - 13:30 Club B**

Open Meeting 1 of Technical Commission TC II/(III+V)

**12:30 - 13:30 Club C**

Open Meeting 1 of Technical Commission TC III/(II+IV)

**12:30 - 13:30 Club D**

Open Meeting 1 of Technical Commission TC IV/(VII+VIII)

**12:30 - 13:30 Club E**

Open Meeting 1 of Technical Commission TC V/(VI)

**12:30 - 13:30 Club H**

Meeting with potential OdM (only by invitation)

**13:30 - 15:00 Meeting Hall II**

IJGI Editorial Board (only by invitation)

**17:00 - 18:30 Zoom Restaurant**

Forum Night + Brock Award Reception (only by invitation)

### Friday 15 July

**12:30 - 13:30 Club A**

Open Meeting 2 of Technical Commission TC I/I

**12:30 - 13:30 Club B**

Open Meeting 2 of Technical Commission TC II/(III+V)

**12:30 - 13:30 Club C**

Open Meeting 2 of Technical Commission TC III/(II+IV)

**12:30 - 13:30 Club D**

Open Meeting 2 of Technical Commission



## TC IV/(VII+VIII)

### **12:30 - 13:30 Club E**

Open Meeting 2 of Technical Commission  
TC V/(VI)

### **13:30 - 15:00 Meeting Hall II**

IJRS Editorial Board Meeting (only by invitation)

## Saturday 16 July

### **8:30 - 10:10 Congress Hall**

Plenary II

### **10:30 - 12:00 Foyer 2nd Floor**

Visit of Exhibitors

### **13:30 - 18:00 Forum Hall**

General Assembly

## Sunday 17 July

### **9:00 - 18:00 Meeting Room 2.2**

CIPA (only by invitation)

### **10:30 - 12:00 Meeting Hall II**

EuroSDR+new TCPs (only by invitation)

### **12:00 - 13:30 Meeting Hall II**

Hand-over Old + new TCP, Old + new Council (only by invitation)

### **14:00 - 15:30 Meeting Hall II**

Incoming TCP Hand-over meeting (only by invitation)

### **16:00 - 18:00 Meeting Hall II**

Foundation (TIF) Board meeting (only by invitation)

### **19:00 - 22:00 Dancing House**

Foundation (TIF) Fundraising Dinner

## Monday 18 July

### **8:30 - 10:10 Congress Hall**

Plenary Session III

### **13:00 - 18:00 Forum Hall**

General Assembly

### **20:00 - 24:00 Žofín Palace**

Congress Gala Dinner

## Tuesday 19 July

### **7:30 - 8:30 Holiday Inn**

Breakfast Meeting Incoming - Outgoing Council

### **8:30 - 10:00 Meeting Hall II**

Meeting of the Incoming TCPs with Regional Reps and Sister Societies (only by invitation)

### **13:30 - 15:30 Congress Hall**

Closing Ceremony

### **19:30 - 21:30 Congress Hall**

Dinner of those who ever have been Council and HM

## Wednesday 20 July

### **9:00 - 17:30 Holiday Inn**

Joint Meeting of the New Council and TCPs

## SOCIAL PROGRAM

### FUN RUN

**Place:** Vyšehrad, Next to the Prague Congress Centre

*Date & Time:* Friday, July 12 , starts at 12:30

### WELCOME RECEPTION

**Place:** Prague Congress Centre, Restaurant ZOOM

*Date & Time:* Tuesday, July 12, 18.30 – 20.30

### EXHIBITOR RECEPTION

**Place:** Prague Congress Centre, Foyer on the 2nd floor

*Date & Time:* Wednesday, July 13, 18.00 – 19.30

### CONCERT – “CZECH MUSIC”

**Place:** Bethlehem Chapel, Prague

*Date & Time:* Thursday, July 14, 20:00 – 22:00

### ISPRS SOCCER CUP

**Place:** Děkanka, Prague

*Date & Time:* Friday, July 15 , 18:00 – 20:00

### YOUTH MEETING ICE-BREAKER PARTY

**Place:** Vagon Music Club, Prague

*Date & Time:* Friday, July 15 , starts at 21:00

### BOAT TRIP + DINNER

**Place:** Vltava River, Prague

*Date & Time:* Saturday, July 16, 20:00 – 22:00

### THEATRE

**Place:** Image Black Light Theatre, Prague

*Date & Time:* Sunday, July 17, 19:30 – 21:30

### CONGRESS GALA DINNER

**Place:** Žofín Palace

*Date & Time:* Monday, July 18, 19:30 – 01:00

### Registration Desk Hours

11 July	13:00 - 17:30
12 July	08:00 - 20:00
13 July	08:00 - 19:00
14 July	08:00 - 18:00
15 July	08:00 - 18:00
16 July	08:00 - 18:00
17 July	08:00 - 18:00
18 July	08:00 - 18:00
19 July	08:00 - 15:30

### Exhibition Hours

12 July	14:00 - 20:30
13 July	8:30 - 21:00
14 July	8:30 - 18:30
15 July	8:30 - 18:30
16 July	8:30 - 16:00



## LIST OF RESERVED BOOTHS AT XXIII ISPRS CONGRESS

### Booth Company

<b>1</b>	National Administration of Surveying, Mapping and Geoinformation of China (NASG) Heilongjiang Seasky Geomatics Technology Co., Ltd. Sichuan Administration of Surveying, Mapping and Geoinformation Chinese Academy of Surveying and Mapping National Geomatics Center of China Beijing Satimage Information Technology Co., Ltd. Beijing Geo-Vision Information Technology Co., Ltd. Map World (Tianjin) Co., Ltd. Beijing Geoway Software Co., Ltd. Leador Spatial Information Technology Co., Ltd.
<b>6</b>	Airbus
<b>7</b>	GEOGIS
<b>8</b>	nFrames GmbH
<b>9</b>	Asia Air Survey
<b>17</b>	Sphere Optics
<b>18</b>	Geodyn Technology
<b>19</b>	BIMTAS
<b>20</b>	MosaicMill Oy / Rikola Oy
<b>21</b>	Avenza
<b>22</b>	Blue Marble Geographics
<b>25</b>	Atlas Ltd, TopoL Software
<b>26</b>	Atlas Ltd, TopoL Software
<b>27</b>	Riegl
<b>28</b>	DATEM
<b>30</b>	PCI Geomatics Enterprises Inc.
<b>32</b>	Zeměměřický Úřad
<b>33</b>	Lead'Air, Inc.
<b>34</b>	MOMRA
<b>36</b>	Phase One
<b>42</b>	Hexagon
<b>50</b>	Vexcel
<b>52</b>	RACURS
<b>53</b>	SBG-SYSTEMS
<b>54</b>	IGI
<b>56</b>	ESRI
<b>57</b>	CompassData, Inc.
<b>58</b>	Pix4D
<b>59</b>	AccuEarth

# PROGRAM XXIII ISPRS

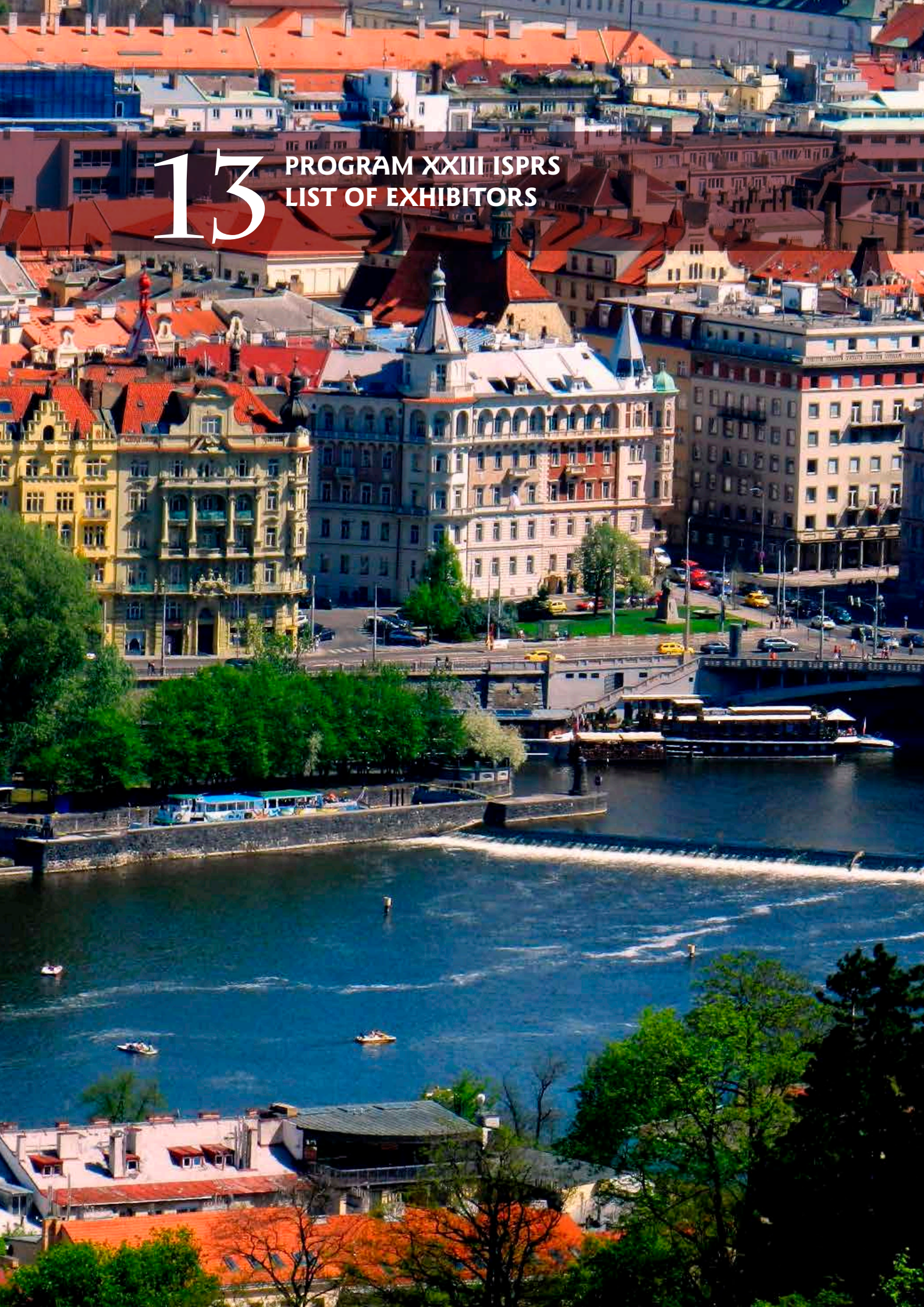
60	Twenty First Century Aerospace Technology
61	Canadian Institute of Geomatics
62	ITRES Research Limited
63	MESCIOĞLU MÜHENDİSLİK VE MÜŞAVİRLİK A.Ş.
64	Meixner
65	Google
69	Dubai Municipality
73	Studio 727
77	PRIMIS
78	InSpace
79	Geometry Factory
81	Visionmap
82	Bentley
83	Trimble Germany
85	SimActive
87	HERE
89	SI Imaging Services
92	Panalytical
97	ISPRS Journal
98	Elsevier
99	Student Consortium, ISPRS Book Series
101	Geosense
102	Media Partners





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## PROGRAM XXIII ISPRS LIST OF EXHIBITORS





## ACCUEARTH (Booth 59)

<b>Website:</b>	<a href="http://accuearth.eu/">http://accuearth.eu/</a>
<b>Address:</b>	Sokolovská 49, 186 00, Praha 8, Czech Republic
<b>Contact:</b>	Paul Soares
<b>Email:</b>	<a href="mailto:info@accuearth.eu">info@accuearth.eu</a>
<b>Telephone:</b>	+420 722 614 197



From our base in the heart of Europe, AccuEarth provides highly accurate GCPs and GIS products to our customers worldwide.

AccuEarth's global network of skilled professionals is continually collecting GCPs

around the world to provide accurate coordinate data for an increasing variety of applications. We utilize accuracy and topo analyst map accuracy software to verify and validate the spatial accuracy of aerial and satellite data as well as verify the accuracy of any pre-existing geospatial data sets.

Our guaranteed and consistent quality of GCPs ensure that you can produce the most accurate enhanced imagery and GIS data sets for your projects.

## AERIAL PHOTOGRAMMETRY AND REMOTE SENSING GROUP CO., LTD. (Booth 1)

<b>Website:</b>	<a href="http://www.arscmh.com">www.arscmh.com</a>	
<b>Address:</b>	Jianxijie 3 Xi'an Shaanxi Province	
<b>Contact:</b>	Mr. Fang Jushan	Ms. Zhang Yan
<b>Email:</b>	<a href="mailto:arscmapping@sina.com">arscmapping@sina.com</a>	<a href="mailto:691449528@qq.com">691449528@qq.com</a>
<b>Telephone:</b>	+86-13609248392	+86-13259413365



(ARSC) remains a client focused geospatial services company, committed to producing quality, tailored products while providing cost-effective solutions. As the leading enterprise in China's geospatial industry, ARSC, the member unit of ISPRS committee, pays

Established in 1965, Aerial Photogrammetry and Remote Sensing Group Co., LTD of China National Administration of Coal Geology

attention to technical quality, hand-picking personnel with high academic and professional credentials, and investing heavily in new technology, with total employees 1340. Our services range from Aerial Photography, Digital Surveying and Mapping, Application and Research of Remote Sensing, GIS Research and Construction, Underground Pipeline Networks Detection, to Development of Computer Information Technology. And our services involves in the fields of city planning, transportation construction, real estates, web map, energy, telecom, mineral resource development geological survey, environmental monitoring, etc.

## AIRBUS DEFENCE AND SPACE (Booth 6)

<b>Website:</b>	<a href="http://www.intelligence-airbusds.com">www.intelligence-airbusds.com</a>
<b>Address:</b>	Claude-Dornier-Str., 88090, Immenstaad, Germany
<b>Contact:</b>	Dr. George Vozikis
<b>Email:</b>	<a href="mailto:george.vozikis@airbus.com">george.vozikis@airbus.com</a>
<b>Telephone:</b>	+49 7545 8-2845



The Intelligence Business Cluster of Airbus Defence and Space is the supplier of choice for commercial satellite imagery, C2ISR systems and related services. Airbus Defence and Space has unrivalled expertise in satellite imagery acquisition, data processing, fusion, dissemination and intelligence extraction allied

to significant command and control capabilities. The company is able to create a comprehensive situational awareness picture and deliver sophisticated end-to-end solutions across all commercial, institutional and defence markets. Based upon exclusive commercial access to Pléiades, SPOT, TerraSAR-X and TanDEM-X satellites, combined with broad applications experience, the company delivers an extensive portfolio spanning the entire geo-information value chain.

## ASIA AIR SURVEY CO., LTD. (Booth 9)

<b>Website:</b>	<a href="http://www.ajiko.co.jp/en/">http://www.ajiko.co.jp/en/</a>
<b>Address:</b>	Shinyuri 21 Building, 1-2-2 Manpukuji, Asao-ku, Kawasaki-shi, Kanagawa Prefecture 215-0004, Japan
<b>Contact:</b>	Mr. Has Baator
<b>Email:</b>	<a href="mailto:has.baator@ajiko.co.jp">has.baator@ajiko.co.jp</a>
<b>Telephone:</b>	+81-44-967-6302 (direct), +81-44-967-6303, +81-80-2337-3219 (cell phone)



Asia Air Survey Co., Ltd. (AAS) is an engineering and consulting company specializing in geo-spatial data acquisition, data processing and system development, as well as providing services for disaster prevention & mitigation and environment. The company's main clients are governments and the private sectors as

well as multisectoral international funded projects.

The headquarters of the company is located in Tokyo, has 45 local offices across Japan and two flight Centres in Tokyo and Osaka. More recently, addition to its joint company in Beijing, AAS established a regional office in Yangon, Myanmar. AAS has been operating since 1965, and as such has the experience to offer geospatial solutions and services to global clients.

## ATLAS LTD. (Booth 25)

<b>Website:</b>	<a href="http://www.atlasltd.cz">www.atlasltd.cz</a>
<b>Address:</b>	Na Krivce 50, 101 00 Praha 10, Czech Republic

<b>Contact:</b>	Petr Krizek
<b>Email:</b>	dmt@atlasltd.cz
<b>Telephone:</b>	+420 272 766 085



ATLAS Ltd. was founded in 1990. It is a private company, based in Prague, with the main focus on developing a graphical software for 3D modeling and visualisation.

The software Atlas DMT (Digital Terrain Model)

can be used for creating terrain surface models from very large elevation data sets. The models are based on a triangulated irregular network and the system includes a graphical environment that offers CAD tools as well as specialized application modules.

ATLAS Ltd. is also an authorized distributor of Gemalto/SafeNet products (digital rights management).

## AVENZA SYSTEMS (Booth 21)

<b>Website:</b>	Avenza Systems Inc.
<b>Address:</b>	124 Merton Street Suite 400, Toronto M4S2Z2 Canada
<b>Contact:</b>	Ted Florence
<b>Email:</b>	ted@avenza.com
<b>Telephone:</b>	(416) 487-5116



Avenza is the producer of geospatial add-ons for Adobe Creative products, which add GIS functionality to the popular and widely-used Adobe environment, as well as the Avenza PDF Maps mobile application for mobile mapping on smart phones and tablets. MAPublisher provides a complete GIS and

cartographic suite of tools and data format support for Adobe Illustrator to create great maps from GIS data. Geographic Imager adds powerful spatial imaging and geospatial data support to Adobe Photoshop. Avenza PDF Maps is a geospatial PDF, GeoPDF and GeoTIFF reader for smartphones and tablets with an imbedded in-app iTunes-like distribution system that allows your GIS-made maps to be truly mobile and merchandised for offline use.

## BEIJING GEO-VISION TECH.CO., LTD. (Booth 1)

<b>Website:</b>	<a href="http://www.jx4.com/en/">http://www.jx4.com/en/</a>
<b>Address:</b>	Building 19, Block 11, ABP, No.188 NanSiHuanXiLu, Fengtai District, Beijing 100070, P.R.CHINA
<b>Contact:</b>	Mr. Gang Zhang
<b>Email:</b>	geovision@foxmail.com
<b>Telephone:</b>	86-10-6822107986-13001278880





Founded in March 1989, Beijing Geo-Vision Tech.co.,Ltd is a high-tech and software enterprise and a part of Chinese Academy of Surveying and mapping. The company is committed to develop modern high-tech production of surveying and mapping, provide the entire solution of the data acquisition,

processing, application and display. According to the requirements of users, Beijing Geo-Vision Information has developed series of products with wide adaptability and domestic independent intellectual property rights. A number of products filled in domestic gaps of surveying and mapping technology, won the "National Science and Technology Progress Award" four times, and greatly promoted the development of surveying and mapping technologies in China.

## BEIJING GEOWAY SOFTWARE CO., LTD. (Booth 1)

<b>Website:</b>	<a href="http://english.geoway.com.cn/">http://english.geoway.com.cn/</a>
<b>Address:</b>	F16 Wanshang Plaza, 22 Shijingshan RD, 100043, Beijing, China
<b>Contact:</b>	Ms. Cui Yujia
<b>Email:</b>	<a href="mailto:shaoyuanzheng@geoway.com.cn">shaoyuanzheng@geoway.com.cn</a>
<b>Telephone:</b>	+86-18801013271

# GEOWAY

*The way of geomatics*

GEOWAY is the leading provider of geomatic solutions in China, with a long history of research and development in the areas of multi-source remote sensing image processing and integrated geospatial information services.

Excellent in software development, system integration, data processing and information services, and integrated business applications, GEOWAY's line of products include GIS, image processing and digital photogrammetry software, as well as core technologies of image matching and map production, providing solutions to urban, land and other important areas.

## BENTLEY SYSTEMS (Booth 82)

<b>Website:</b>	<a href="http://www.bentley.com">www.bentley.com</a>
<b>Address:</b>	Bentley Systems Polska sp. z o.o., Ul. Nowogrodzka 68, 02-014 Warszawa, Polska
<b>Contact:</b>	Mirosław Pawelec
<b>Email:</b>	<a href="mailto:miroslaw.pawelec@bentley.com">miroslaw.pawelec@bentley.com</a>
<b>Telephone:</b>	+48 693807107



Bentley Systems is a global leader in providing architects, engineers, geospatial professionals, constructors, and owner-operators with comprehensive software solutions for advancing the design, construction, and

operations of infrastructure. Bentley users leverage information mobility across disciplines and throughout the infrastructure lifecycle to deliver better-performing projects and assets. Bentley solutions encompass MicroStation applications for information modeling, ProjectWise collaboration services to deliver integrated projects, and AssetWise operations services to achieve intelligent

infrastructure– complemented by worldwide managed services.  
professional services and comprehensive

## BIMTAS (Booth 19)

<b>Website:</b>	www.bimtas.istanbul
<b>Address:</b>	BIMTAS Inc., Evliya Celebi Mah., Mesrutiyet Cad. Eski, Tuyap Binasi No:50, Beyoglu, Istanbul / Turkey
<b>Contact:</b>	Dr. Gurcan Buyuksalih
<b>Email:</b>	gb@bimtas.istanbul
<b>Telephone:</b>	+90 212 2459900 ext. 1190



BIMTAS has been providing engineering, consultancy and project services to affiliates of Istanbul Metropolitan Municipality, district municipalities, public and private institutions for the realization of infrastructure and superstructure investments as a matter of planned and healthy urbanization since 1997. Having accomplished several studies that changes the face of Istanbul, a city progressing rapidly to be a global center, BIMTAS has been meeting the demands of local governments and private sector by providing services both domestically and abroad such as feasibility, surveying, project and consultancy in all aspects of life ranging from stream rehabilitation to marine structures, energy, metro systems, industrial facilities, cultural centers, sports complexes, park and garden arrangements. In addition, the use of Laser Scanning Technologies with the aim

of recording architectural cultural heritage and generating technical drawing, restitution and restoration projects, BIMTAS has been giving services to public and private sectors in converting 3D laser point clouds into the accurate and detailed 3D CAD drawings and solid models. It has the feature of being the only center in our country providing service in “3D Mapping and generating city model at different levels by using Airborne Laser Scanning” which is another application area of Laser Scanning Technologies. 3D Mapping and City Modeling work which has been generated for the first time in Turkey has been specific to Istanbul and been presented for the use of Metropolitan Municipality. Finally, Bimtas is now dealing with the smart city applications. It aims to generate first 3D platform of Istanbul to integrate and visualize the databases of municipal functionalities like, public transportation, water system, natural gas services etc. Such a platform can ease the life of people and give a way to apply smart apps from mobile and web-based platform.

## BLUE MARBLE GEOGRAPHICS (Booth 22)

<b>Website:</b>	www.bluemarblegeo.com
<b>Address:</b>	22 Carriage Ln, Hallowell, Maine 04347, USA
<b>Contact:</b>	Myles LaBonte
<b>Email:</b>	marketing@bluemarblegeo.com
<b>Telephone:</b>	(800) 616-2725



Since the early 1990s, Blue Marble Geographics has been a pioneer in the development of powerful and innovative geospatial software. Widely regarded for

its expertise in coordinate conversion and file format support, Blue Marble's products include Geographic Calculator, the paradigm for highly accurate spatial data conversion and advanced projection management; Global Mapper, a fully-functional and inexpensive GIS application; and the Global Mapper LiDAR Module, a suite of powerful point cloud processing tools.

## CANADIAN INSTITUTE OF GEOMATICS & CANADIAN REMOTE SENSING SOCIETY (Booth 61)

<b>Website:</b>	<a href="http://www.cig-acsg.ca">http://www.cig-acsg.ca</a>	<a href="http://www.crss-sct.ca">www.crss-sct.ca</a>
<b>Address:</b>	100 D – 900 Dynes Road, Ottawa, Ontario Canada K2C 3L6	Regina, Saskatchewan, Canada
<b>Contact:</b>	Alex Giannelia, B.A.A, President	Prof. Joe Piwowar
<b>Email:</b>	<a href="mailto:admindig@magma.ca">admindig@magma.ca</a>	<a href="mailto:treasurer@crss-sct.ca">treasurer@crss-sct.ca</a>
<b>Telephone:</b>	+1.613.224.9851	+1.306.585.5273



The Canadian Institute of Geomatics – Association canadienne des sciences géomatiques (CIG-ACSG) has evolved to be a non-profit scientific and technical association and represents the largest and most influential geospatial knowledge network in Canada. Over 50% of its members are senior managers and researchers in government, private sector,

academic and NGO organizations. The CIG has long been an active and the representing Canadian member of the ISPRS, ICA and the FIG.

The genesis of remote sensing activities that led to the formation of the Canadian Remote Sensing Society – Société canadienne de télédétection (CRSS-SCT) began in the 1960's. These activities encompassed government, industry, and educational institutions. Since 1972 the CRSS-SCT has been running the world's oldest on-going national symposium dedicated to remote sensing.

## COMPASSDATA INC. (Booth 57)

<b>Website:</b>	<a href="http://www.compassdatainc.com/">http://www.compassdatainc.com/</a>
<b>Address:</b>	12353 East Easter Avenue, Suite 200, Centennial, Co 80112
<b>Contact:</b>	LoAnn Crane
<b>Email:</b>	<a href="mailto:Marketing@compassholdingsinc.com">Marketing@compassholdingsinc.com</a>
<b>Telephone:</b>	Office 303-999-3035 Cell 720-257-1787



CompassData, Inc., located in Centennial, Colorado, is the industry leader and supplier of

current, accurate GPS based data collection and ground control survey. Since 1994, CompassData's capacity to effectively perform work in locations ranging from dense urban settings to remote environments comes from



experience addressing logistical and safety considerations inherent to survey situations. As the industry leader, CompassData has standardized, industry-accepted processes for collection, analysis and delivery of timely,

concise, and user-friendly data. CompassData maintains the largest commercially available Ground Control Point archive in the world with over 40,000 points available today, and growing daily.

### CZECH OFFICE FOR SURVEYING, MAPPING AND CADASTRE (ÚZK) (Booth 32)

<b>Website:</b>	<a href="http://www.cuzk.cz/">http://www.cuzk.cz/</a>
<b>Address:</b>	Pod sídlištěm 1800/9, 182 11 Praha 8
<b>Contact:</b>	Office team
<b>Email:</b>	<a href="mailto:cuzk@cuzk.cz">cuzk@cuzk.cz</a>
<b>Telephone:</b>	+420 284 041 111



Czech Office for Surveying, Mapping and Cadastre (ÚZK) manages state administration of the cadastre of real estate in the Czech Republic and ensures performance of surveying activities in the public interest given by the law. The main tasks are:

- Complete administration of the cadastre of real estate
- Maintenance of geodetic control

- State mapping of the Czech Republic
- Creation and actualization of the Fundamental Base of Geographic Data
- Maintenance and documentation of the state border
- Development and maintenance of the Information System of Surveying, Mapping and Cadastre
- Standardization of geographical names
- Administration of the Central Archive of Surveying and Cadastre

### DAT/EM SYSTEMS INTERNATIONAL (Booth 28)

<b>Website:</b>	<a href="http://www.datem.com">www.datem.com</a>
<b>Address:</b>	2014 Merrill Field Drive, Anchorage, Alaska 99501 USA
<b>Contact:</b>	Stan Moll
<b>Email:</b>	<a href="mailto:sales@datem.com">sales@datem.com</a>
<b>Telephone:</b>	+1.907.229.7041



DAT/EM Systems International develops software for the photogrammetric, engineering and GIS industries that enables the extraction of 3D vector features from stereo imagery and

point clouds.

DAT/EM's suite of software solutions includes Summit Evolution™ photogrammetric workstation, LandScape™ point cloud viewing and editing toolkit, and complementary components Capture™, MapEditor™, Ortho+Mosaic™, Airfield3DTM and Contour Creator™. New to the DAT/EM

Photogrammetric Suite, Summit UASTM provides a set of tools to easily analyze or compare UAS data by viewing, editing and defining features in stereo.

Visit DAT/EM at geospatial events worldwide for a demo, or contact our worldwide network of resellers to learn more.

## DUBAI MUNICIPALITY (Booth 69) - GOLD SPONZOR

<b>Website:</b>	www.dm.gov.ae
<b>Address:</b>	Dubai, Baniyas Road, UAE
<b>Contact:</b>	Anna Zih, Hussein M. Abdulmuttalib
<b>Email:</b>	husseinma@dm.gov.ae
<b>Telephone:</b>	+971564898599; +971555500452



The origin of Dubai Municipality was founded in 1954, commencing its activities with a cadre of seven employees undertaking simple tasks in cleaning the city. The first decree establishing the Municipality was on February 28, 1957, whereby 23 municipal council members had been appointed from the elders of the country and traders with limited powers, the most important of which was to take care of health and architectural affairs of the city as well as to organize construction and beautification of the city and provide constructive suggestions to the government. Dubai Municipality is regarded as one of the

largest governmental institutions in terms of services rendered and projects executed. Thus the municipality is the leading driver of growth and evolution of the Emirate of Dubai. Dubai Municipality is the custodian of geospatial data for the Emirate of Dubai and has been instrumental in ensuring the application of these technologies across various government departments in Dubai. The Municipality also organizes the GIS and Remote Sensing Annual Scientific Forum (GRASF) in association with the Middle East Geospatial Forum. The Forum, which is held every year in Dubai, has quickly become the most sought after congregation of geospatial professionals in the region and addresses various challenges faced by the technology implementers from across the region.

## EUCLIDEON EUROPE (Booth 64)

<b>Website:</b>	www.euclidean.com
<b>Address:</b>	Linke Wienzeile 4
<b>Contact:</b>	DI Dr Philipp Meixner
<b>Email:</b>	office@meixnerimaging.com
<b>Telephone:</b>	+43 1 587 96 16



Geoverse software, designed for users to

Euclidean Europe offer a range of products, including its ready-made

instantly and effortlessly visualise 3D point cloud data in its geospatial context; its conversion software, which allows users to compress their point-cloud data down to 5-20% of its original size for effortless storage, streaming and use in Geoverse;

SOLIDSCAN converts a laser scan into a

solid, photo-realistic representation of the real world. There is no upper limit to the detail that can be reproduced using SOLIDSCAN. Incredibly, Euclidean's SOLIDSCAN removes moving objects and 90% of the background noise from laser scanned data – only static

objects remain. Reflective surfaces like whiteboards and mirrors can now be laser scanned with photo-realistic results. SOLIDSCAN technology creates many new opportunities for scanning organizations.

## ESRI (Booth 56)

<b>Website:</b>	<a href="http://www.esri.com/industries/mapping-statistics-imagery/imagery-3d">http://www.esri.com/industries/mapping-statistics-imagery/imagery-3d</a>
<b>Address:</b>	380 New York Street, Redlands, CA 92373, USA
<b>Contact:</b>	Kurt Schwoppe
<b>Email:</b>	<a href="mailto:kschwoppe@esri.com">kschwoppe@esri.com</a>
<b>Telephone:</b>	+1 909 793 2853 extension 5108



Esri, the leader in GIS

technology, offers innovative solutions for enterprise imagery management and web GIS. The amount of high resolution remotely sensed data and elevation data is expanding,

while the cost is falling. The Esri ArcGIS platform provides the tools and capabilities to make imagery, lidar and elevation data relevant and valuable. Esri technology includes tools, workflows, and applications that can be quickly implemented within an organization to help you see your project, find the patterns and share the results with others.

## GEODYN (Booth 18)

<b>Website:</b>	<a href="http://www.geodyn.com">www.geodyn.com</a>
<b>Address:</b>	623, 6EA, DAFZ, Dubai, UAE
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<b>Email:</b>	<a href="mailto:rolf.becker@geodyn.com">rolf.becker@geodyn.com</a> , <a href="mailto:info@geodyn.com">info@geodyn.com</a>
<b>Telephone:</b>	00971 (0)4 214 6270



Geodyn has been set up with the leading personal from the former Maps Geosystems. They are those who have devised procedures that turned into standard operations in the mapping industry.

GeoDyn today concentrates on aspects such as the introduction of temporal data attributes into GIS, and defining the relevance of applicable data layers. This leads to minimize data acquisition requirements which in turn shortens planning operations and reduces

cost substantially.

GeoDyn believes that there is an imminent requirement for the analogue/Digital conversion of aerial photography and this not only to safeguard a country's heritage, but to be able to reappraise predictions made previously and corresponding corrective measures taken at the time, if any.

In view of the above GeoDyn developed an Analogue to Digital conversion procedure that is by a magnitude faster than conventional procedures, thereby making important data accessible to a larger user community.



## GEOGIS (Booth 7)

<b>Website:</b>	<a href="http://www.geogis.com.tr/Default_eng.aspx">http://www.geogis.com.tr/Default_eng.aspx</a>
<b>Address:</b>	Mutlukent Mah. 1920 Cad. No: 69 Umitkoy / Cankaya / Ankara / TURKEY
<b>Contact:</b>	Tuncer Ozerbil
<b>Email:</b>	<a href="mailto:tozerbil@geogis.com.tr">tozerbil@geogis.com.tr</a>
<b>Telephone:</b>	+90 312 236 4260



GEOGIS is a mapping company established in Ankara/TURKEY in 1997. The company has more than 60 engineers, consisting of surveyors, civil engineers, city planners, agriculture engineers, geologists, and that number reaches to 200 considering the technicians and field workers.

GEOGIS implements photogrammetric projects by using its own airplane and 2 aerial cameras. Besides photogrammetric projects GEOGIS is one of the lead mapping company in Turkey at areas of core expertise below.

- Geodetic and Photogrammetric Map Production
- 3D City Modelling - Geographic Information Systems
- Transportation Projects - Digital Map Production
- Application of Development Plans
- Infrastructural Services
- Pipe Line Projects
- Urban Information Systems
- Supervision and Consultancy Services
- Hydro Electric Projects
- Real Estate Appraisal Services

## GEOMETRY FACTORY (Booth 79)

<b>Website:</b>	<a href="http://www.geometryfactory.com">www.geometryfactory.com</a>
<b>Address:</b>	1501 route des Dolines, Le Thélème, 06560 Valbonne – Sophia Antipolis, France
<b>Contact:</b>	Andreas Fabri
<b>Email:</b>	<a href="mailto:andreas.fabri@geometryfactory.com">andreas.fabri@geometryfactory.com</a>
<b>Telephone:</b>	+33 492.954.912



GeometryFactory provides flexible and robust geometric software components as well as expertise in geometric computing to more than 300 customers worldwide. We give development teams a head-start on building applications that solve business problems, increasing productivity and the ability to deliver products on time.

We offer field-proven C++ components, which are part of CGAL, the Computational Geometry Algorithms Library.

Our customers in the application area photogrammetry and GIS use 3D triangulations, Boolean operations on polygons and surface meshes, polyline simplification, and surface reconstruction from point clouds, to name but a few.

## GGG GMBH (Booth 26)

<b>Website:</b>	www.ggs-speyer.de / www.aerotopol.de
<b>Address:</b>	GGG - Geotechnik, Geoinformatik & Service GmbH, Kaemmererstr. 14, 67346, Speyer, Germany
<b>Contact:</b>	Gerhard Kemper (CEO)
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<b>Telephone:</b>	+49 6232 629271, Mobile: +49 171 3588546



GGG GmbH is a medium sized company that was founded in 1988. Since 2004, the main focus is on the aerial surveying market. Having 6 employees, GGG develops, integrates and supports systems for various aerial data acquisition. Aerial cameras as single or multi-sensor setups, oblique imager, thermal sensors, hyper-spectral scanners and Lidar

are the sensors in our portfolio. Our additional instruments as gyro stabilized mounts, GNSS-INS, power-supplies, onboard PC, pilot screens and shock mountings support a proper installation of the sensors. We also offer mission planning and flight management software designed for a perfect interfacing with all of our components. That way we are able to deliver turnkey solutions. We assist in installation and offer onsite training. Besides that, we also integrate existing equipment and do user specific integration.

## GOOGLE EARTH ENGINE (Booth 65)

<b>Website:</b>	www.earthengine.google.com
<b>Address:</b>	2590 Pearl Street Boulder 80302, Colorado, USA
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<b>Email:</b>	dustyr@google.com
<b>Telephone:</b>	303-385-4953



Earth Engine is Google's cloud platform for petabyte-scale analysis of satellite imagery and other geospatial data. Originally conceived in

2009 as a platform for global forest monitoring, today scientists, governments, and NGOs around the world are using Earth Engine in areas ranging from food and water security to disaster risk management, public health, biodiversity, and climate change adaptation.

## HEILONGJIANG SEASKY GEOMATICS TECHNOLOGY CO., LTD. (Booth 1)

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Heilongjiang Seasky Geomatics Technology Co.,Ltd.

founded in 2004, is a professional company for Photogrammetry and Remote Sensing. Affiliated to Heilongjiang Administration of Surveying, Mapping and Geoinformation, Seasky has national Grade A qualifications for Photogrammetry and Remote Sensing, Geographical Information System Engineering, Engineering Surveying, Real Estate Surveying and Mapping, Cartography. In 2012, Seasky passed the ISO 9001:2008 standard quality

management system certifications. As an outsourcing service provider, Seasky is one of the largest production bases for international geo-informatic data processing in China. For aerial images, satellite images, LiDAR data and other multiple-source data, Seasky develops different technical solutions for data compilation, image processing, GIS database construction and application, 3D landscape products, thematic mapping products etc.

## HERE (Booth 87)

<b>Website:</b>	www.here.com
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HERE is a leader in mapping and location technology backed by a consortium of leading automotive companies Audi, BMW and Daimler. HERE has been mapping the world for 30 years, helping people and companies around the world answer the pressing questions they have. Every time you use the map in your car; every

time you get a package delivered; every time you create an event map on your favorite social network, chances are HERE is behind it.

Our mapping technology powers leading services on six continents. Today, we're helping people in 1,000 cities catch their trains; we're helping millions of people in 50 countries beat traffic; and we're helping companies better route their fleets.

## HEXAGON (Booth 42) - PLATINUM SPONSOR

<b>Website:</b>	www.hexagongeospatial.com
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# HEXAGON

Hexagon Geospatial helps you make sense of the dynamically changing world. Known globally as a maker of leading-edge technology, we enable our customers to

easily transform their data into actionable information, shortening the lifecycle from the moment of change to action. Hexagon Geospatial provides the software products and platforms to a large variety of customers through direct sales, channel partners, and Hexagon businesses. For more information, visit [hexagongeospatial.com](http://hexagongeospatial.com) or contact us at [marketing@hexagongeospatial.com](mailto:marketing@hexagongeospatial.com).



Geospatial is part of Hexagon, a leading global provider of information technologies that drive productivity and quality across geospatial and industrial enterprise applications. Hexagon's solutions integrate sensors, software, domain knowledge and customer workflows into intelligent information ecosystems that deliver

actionable information. They are used in a broad range of vital industries. Hexagon (Nasdaq Stockholm: HEXA B) has more than 16,000 employees in 46 countries and net sales of approximately 3.4bn USD. Learn more at [hexagon.com](http://hexagon.com) and follow us @HexagonAB.

### IGI (Booth 54)

<b>Website:</b>	<a href="http://www.igi.eu">www.igi.eu</a>
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<b>Email:</b>	<a href="mailto:info@igi-systems.com">info@igi-systems.com</a>
<b>Telephone:</b>	+49 2732 5525-0



mechanics, software development, and

IGI covers a wide variety of expertise in optics, electronics,

analytics through a team of highly qualified scientists, engineers and technicians. With more than 35 years of experience, IGI not only offers integration of various sensors, but also complete sensor systems for airborne + terrestrial survey missions.

### INSPLACE CO., LTD. (Booth 78)

<b>Website:</b>	<a href="http://www.inspace.re.kr">www.inspace.re.kr</a>
<b>Address:</b>	96, Gajeongbuk-ro, Yuseong-gu, Daejeon, Rep of Korea
<b>Contact:</b>	Myungjin Choi, CEO
<b>Email:</b>	<a href="mailto:prime@inspace.re.kr">prime@inspace.re.kr</a>
<b>Telephone:</b>	+82 42 862 2735



specialized in research and development,

InSpace Co., Ltd. is a venture company

spun off from the Korea Aerospace Research Institute (KARI) to keep up with the current trends of the convergence between Space Technology (ST) and Information Communication Technology (ICT).

### ITRES (Booth 62)

<b>Website:</b>	<a href="http://www.itres.com">www.itres.com</a>
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<b>Contact:</b>	JoAnne DeVries
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<b>Telephone:</b>	+1 403-250-9944



ITRES provides

(1979) airborne

hyperspectral and thermal remote sensing imagers and surveys. Our custom sensors are

used for applications in mineral & geology, heat loss, fire mapping, search and rescue, coastlines, water quality, and target detection among others.

The TSR-1800 system features in-flight geocorrection and automated thermal anomaly detection, with high spatial/thermal resolution. Fly fast (up to 170-300kts), with resolutions ranging from 5cm to 1 m and

0.05°C thermal resolution.

New to our performance hyperspectral sensor lineup are the integrated CASI-1500H (VNIR) and wide-swath SASI-1000A (200 channel, 1000 x-track imaging pixel SWIR imager). We have also launched our new UAV/Ground sensors: the  $\mu$ VNIR-1920, the  $\mu$ TIR-640 and the  $\mu$ SWIR-384.

## LEADOR SPATIAL INFORMATION TECHNOLOGY CO., LTD. (Booth 1)

<b>Website:</b>	www.leador.com.cn	
<b>Address:</b>	Bldg.12, HUST Science Park Innovation Base, No33, Tangxunhu North Road, East Lake Dev. Zone, Wuhan, Hubei, China	
<b>Contact:</b>	Kai Sun	Ms. Wang Xiaohui
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Leador Spatial Information Technology Co., Ltd was founded in

September 1999. The company is committed to promoting industrial upgrading and facilitating the use of geographic information by taking advantage of mobile mapping technology. The company currently employs more than 400 people, 30% of them have master or doctoral degree. The R & D

department, excellent at Multi-disciplinary design and complex systems integration, has technical talents from fields of optical, electronic, mechanical, automatic control, mapping, remote sensing, visual images, Internet, etc. Through years of efforts and hard work, Leador has pioneered the concept of 3D image GIS and become the leading manufacturer of land-based Mobile Mapping Systems (MMS) in China, which is now widely used in digital city, city management, public security, emergency response, digital highway, digital railroad, LBS, etc.

## LEICA GEOSYSTEMS (Booth 42) - Platinum Sponsor

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<b>Telephone:</b>	+41 71 727 3656



With close to 200 years of pioneering solutions to measure the world, Leica Geosystems products

and services are trusted by professionals worldwide to help them capture, analyze, and present spatial information. Leica Geosystems is best known for its broad array of products that capture accurately, model quickly, analyze

easily, and visualize and present spatial information.

Those who use Leica Geosystems products every day trust them for their dependability, the value they deliver, and the superior customer support. Based in Heerbrugg, Switzerland,

Leica Geosystems is a global company with tens of thousands of customers supported by more than 3,500 employees in 28 countries and hundreds of partners located in more than 120 countries around the world. Leica Geosystems is part of Hexagon, Sweden.

## MAP WORLD (TIANJIN) CO., LTD. (Booth 1)

<b>Website:</b>	<a href="http://www.map tj.cn/guid/first.htm">http://www.map tj.cn/guid/first.htm</a>
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Tianjin Binhai Geoinformation Innovation Park & Mapworld Global Data Service Base, is located in Tianjin High-Tech Area (also the National Innovation Demonstration Area), assembling Mapworld Tianjin National Data

Base, Mapworld International Communication Centre, Mapworld Information Science Institute, Mapworld Zhongchuang Space Incubator, Mapworld International Conference Exhibition Centre, Map world(Tianjin) Co.,Ltd., Tiandi Beidou (Tianjin) Navigation Technology Co.,Ltd., and Mapworld Data & Multi-Language Manufacturing Base, etc.

## MEIXNER IMAGING (Booth 64)

<b>Website:</b>	<a href="http://www.meixnerimaging.com">www.meixnerimaging.com</a>
<b>Address:</b>	Linke Wienzeile 4
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<b>Email:</b>	<a href="mailto:office@meixnerimaging.com">office@meixnerimaging.com</a>
<b>Telephone:</b>	+43 1 587 96 16



products.

Geoverse MDM and UnlimitedOrtho are revolutionary new geospatial software solutions that enable users to visualize, manipulate and interact with image and point cloud data – regardless of size – without loading times. This technology is able to handle the vast amounts of data and link it with external databases in a way previously

MEIXNER IMAGING is the exclusive distributor for Euclidean's ready-made Geoverse

unimaginable on normal computers and stream it over the web.

Our latest solution SolidsScan converts a laser scan into a solid, photo-realistic representation of the real world, with the same accuracy as LiDAR. SolidsScan does not natively "interpolate" points – instead, SolidsScan uses a new, patented technique to produce solid photo-realistic point clouds with no holes.

In combination with udWeb customer are able to share all their data with clients and partners around the world on e.g. their website.

## MESCIOĞLU MÜHENDİŞLİK VE MÜŞAVİRLİK A.Ş. (Booth 63)

<b>Website:</b>	www.mescioglu.com.tr
<b>Address:</b>	Mesciolu Plaza, Mutlukent Mah., 1920. Cadde No:65, 06810 Ümitköy - Çankaya/Ankara - TURKEY
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MESCOLU ENGINEERING was founded by Ayhan Faruk MESC in 1984 and has been offering services in mapping, engineering, surveying, photogrammetry and supervision and consultancy of infrastructural projects including railways and highways for more than 30 years in Turkey. Moreover, Mesciolu has

also carried out transportation master planning and water resources management projects which are essential necessities of our country. 80% of the workforce in photogrammetry services in Turkey has been undertaken by Mesciolu as of December 2015. As being the leading firm in the sector with our technical capabilities in our services, quality procedures and our corporate culture based on trust, our aim is to continue to accelerate our client satisfaction.

## MINISTRY OF MUNICIPAL AND RURAL AFFAIRS OF SAUDI ARABIA (MOMRA) (Booth 34) - BRONZE SPONSOR

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Ministry for Municipal and Rural Affairs  
Kingdom of Saudi Arabia

The Ministry of Municipal and Rural Affairs (MOMRA) is a government organization in the Kingdom of Saudi Arabia, established

by Royal Decree in October, 1975 and assigned the responsibility for planning and developing urban and rural areas and the administrative oversight of the management of more than 300 municipalities throughout the Kingdom of Saudi Arabia.

## MOSAICMILL (Booth 20)

<b>Website:</b>	www.mosaicmill.com
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## MosaicMill

MosaicMill is developer of EnsoMOSAIC aerial survey system which comes with hyperspectral, multispectral or thermal cameras. MosaicMill is specialized in forestry

and precision agriculture - EnsoMOSAIC Agri is a complete package with high-resolution NDVI sensor, reflectance targets and software for generation of NDVI and prescription maps. MosaicMill is also distributor of GeoDrone UAS and Terra software for automatic point cloud classification and vectorization.

## NATIONAL ADMINISTRATION OF SURVEYING, MAPPING AND GEOINFORMATION OF CHINA (NASG) (Booth 1)

<b>Website:</b>	<a href="http://en.nasg.gov.cn/">http://en.nasg.gov.cn/</a>
<b>Address:</b>	No.28 Lianhuachi West Road, Haidian District, Beijing, 100830, China
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Established in 1956, National Administration of Surveying, Mapping and Geoinformation of China (NASG) is a central government agency responsible for surveying, mapping and geoinformation of the country. NASG has 18 sub-institutions and the total staff member accounts for more than 8,000, local surveying, mapping and geoinformation administrations were established in all China's 31 provinces, autonomous regions and municipalities. In recent years, surveying, mapping and

geoinformation developed rapidly and series of achievements were witnessed. On June 1, 2015, the Outline of Medium and Long-term Planning of National Fundamental Surveying and Mapping (2015-2030) was approved by the State Council, which was an important decision deployment of strengthening and promoting surveying, mapping and geoinformation in China and will better serve socio-economic development and people's daily life in the future.

## NATIONAL ENGINEERING RESEARCH CENTER OF SURVEYING AND MAPPING (Booth 1)

<b>Website:</b>	<a href="http://english.casm.ac.cn/">http://english.casm.ac.cn/</a>
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<b>Telephone:</b>	+86-10-63880812

National Engineering Research Center of Surveying and Mapping was established in 2009, and passed the acceptance test of the Ministry of Science and Technology of China in 2013. The Center is a sub-division of the Chinese Academy of Surveying and Mapping and under the supervision of National Administration of Surveying, Mapping and Geoinformation of China (NASG). The aim of

the center is to establish an industrialization research, development and service entity for surveying and mapping technology. Its main tasks include surveying and mapping industrialization application and engineering technology research, transformation of achievements, open services, and international cooperation.

## NATIONAL GEOMATICS CENTER OF CHINA (Booth 1)

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<b>Telephone:</b>	+86-10-63881109



### 国家基础地理信息中心 NGCC National Geomatics Center of China

National Geomatics Center of China (NGCC), also functioned as National Archives for Surveying and Mapping, is a government agency subordinated to National Administration of Surveying, Mapping and Geoinformation of China (NASG). The staff

team consists of 150 members from 17 departments. NGCC fulfills the missions to construct, manage and distribute national fundamental data and archives; plan, design, organize and execute national major surveying and mapping projects; maintain surveying and mapping networks in China; develop applications of national fundamental geoinformation.

## NFRAMES (Booth 8)

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### nFrames

nFrames is a company developing software for 3D surface reconstruction from images. The core software product SURE is designed

for professional mapping production.

It is particularly focused on the derivation of precise point clouds, DSMs, True Orthophotos and textured meshes for projects with large scale such as country-wide airborne image datasets.

## PANALYTICAL, ASD INC. (Booth 92)

<b>Website:</b>	<a href="http://www.ASDI.com">www.ASDI.com</a>
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<b>Telephone:</b>	1 720 399 1874



As a part of PANalytical, ASD Inc. is the world's leading supplier of precision field portable, full-

range (350-2500 nm) spectrometers and spectroradiometers. ASD's ruggedized analytical instruments provide the freedom to rapidly collect high-quality spectra in the field for real-time lab quality results. When accuracy matters and success is measured in manometers, see why the world's leading

research institutions depend on ASD for data that can be trusted. For more information

please visit [www.asdi.com](http://www.asdi.com).

### PCI GEOMATICS (Booth 30)

<b>Website:</b>	<a href="http://www.pcigeomatics.com">www.pcigeomatics.com</a>
<b>Address:</b>	90 Allstate Parkway, Suite 501, Markham, ON, L3R 6H3
<b>Contact:</b>	Mr. Arnold Hougham
<b>Email:</b>	<a href="mailto:info@pcigeomatics.com">info@pcigeomatics.com</a>
<b>Telephone:</b>	905-764-0614



PCI Geomatics, founded in 1982, is the world

leader in geo-imaging products and solutions. PCI Geomatics has set the standard in remote sensing and image processing tools offering customized solutions to the geomatics community in over 135 countries.

PCI Geomatics is the developer of Geomatica®- a complete and integrated desktop software that features tools for remote sensing, digital photogrammetry, geospatial analysis, map production, mosaicking and

more. Geomatica® software enables users to apply imagery in support of a wide range of applications such as the environment, agriculture, security and intelligence, defense, as well as in the oil and gas industries.

PCI Geomatics is also the developer of the Geolmaging Accelerator (GXL), an automated, high performance, Graphics Processor (GPU) system for processing terabytes of imagery data. PCI Geomatics is a privately held Canadian corporation headquartered in Toronto, Ontario and Gatineau, Quebec with worldwide facilities located in the United States; Arlington and Beijing, China

### PHASE ONE (Booth 73)

<b>Website:</b>	<a href="http://industrial.phaseone.com">http://industrial.phaseone.com</a>
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<b>Telephone:</b>	+44 7482 324 013



Phase One Industrial is dedicated to research, development and manufacturing of medium format, metric cameras for aerial photography. Phase One cameras are known for their image quality, accuracy and easy integration with leading flight management systems, IMU/GNSS receivers and all popular LIDAR systems.

Phase One's flagship camera series, the iXU

1000, incorporate a 100 MP CMOS sensor and offers large format coverage at medium format size and price. These cameras are distinguished by their high resolution, wide ISO range and fast capture rate.

With a wide choice of lenses, Phase One offers solutions for everything from small UAVs up to large manned aircraft.

## PIX4D (Booth 58)

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<b>Contact:</b>	Nikoleta Guetcheva
<b>Email:</b>	nikoleta@pix4d.com
<b>Telephone:</b>	+41 (0) 21 552 05 90



Pix4D is the developer and producer of Pix4Dmapper, a software based on computer vision and photogrammetry. Pix4Dmapper automatically processes both terrestrial and

drone/aircraft-acquired imagery, converting it into highly accurate orthomosaics, surface models, point clouds, textured 3D and simplified CAD models. Pix4D, rapidly expanding since its founding in 2011, is headquartered in Lausanne, Switzerland, with local offices in Shanghai and San Francisco.

## PRIMIS (Booth 77)

<b>Website:</b>	www.primis.cz
<b>Address:</b>	Slavičková 827/1a, 638 00 Brno, Czech Republic
<b>Contact:</b>	Patrik Meixner / Marta Meixnerová
<b>Email:</b>	patrik.meixner@primis.cz/ marta.meixnerova@primis.cz
<b>Telephone:</b>	+420 724 013 013 / +420 733 188 823



PRIMIS – Professional Imaging and Mapping Solutions. Though we are still rather newly established company (2014) we benefit from the vast experience in the field of photogrammetry and remote sensing amassed by our key staff

during past 23 years. Our services encompass flight planning, data acquisition by aerial sensors, photogrammetric data processing up to delivery of products in various forms and formats both of contemporary and historical data. Our sophisticated workflow ensures keeping the strictest quality control measures in order to satisfy the needs of our customers from diverse corners of the world.

## RIEGL (Booth 27)

<b>Website:</b>	www.riegl.com
<b>Address:</b>	Riedenburgstrasse 48, 3580 Horn, Austria
<b>Contact:</b>	Sales team
<b>Email:</b>	sales@riegl.com, office@riegl.com
<b>Telephone:</b>	+43 2982 4211



RIEGL based in Austria is a performance

leader in research, development and production of terrestrial, industrial, mobile, bathymetric, airborne and UAS-based laser scanning systems. RIEGL's innovative hardware and software provides powerful solutions for



most application fields in surveying.

Worldwide sales, training, support and services are delivered from RIEGL's Austrian headquarters and its offices in Vienna, Salzburg, and Styria, main offices in the USA,

Japan, and in China, and by a worldwide network of representatives covering Europe, North and South America, Asia, Australia and Africa.

For more information, visit [www.riegl.com](http://www.riegl.com).

### SENOP OY (Booth 20)

<b>Website:</b>	<a href="http://www.rikola.fi">www.rikola.fi</a>
<b>Address:</b>	Kultarikontie 1, Vantaa 01300, Finland
<b>Contact:</b>	Jussi Soukkamaki
<b>Email:</b>	<a href="mailto:Jussi@rikola.fi">Jussi@rikola.fi</a>
<b>Telephone:</b>	+358503583516



Senop OY offers a lightweight

hyperspectral camera for UAVs. This product is a snapshot spectral system providing only true image pixels for up to 380 bands. No interpolation is used in image formation. The frame based approach enables an easy image

stitching for the mosaics with high resolution images. The solution doesn't need IMU for its operations, which makes the system low cost and low weight. In addition, the camera enables handheld use with computers in laboratories, fields etc. Senop OY offers also OEM multichannel and LED-modules as well as miniature spectrometers.

### SATELLITE SURVEYING AND MAPPING APPLICATION CENTER, NASG (Booth 1)

<b>Website:</b>	<a href="http://en.nasg.gov.cn">http://en.nasg.gov.cn</a>
<b>Address:</b>	28 Lianhuachixi Road, Haidian District, Beijing 100830, China
<b>Contact:</b>	Hao Minghui
<b>Email:</b>	<a href="mailto:mhhao1228@hotmail.com">mhhao1228@hotmail.com</a>
<b>Telephone:</b>	+86 10 63881902



and Geoinformation of China. SASMAC is mainly responsible for development plans of satellite surveying and mapping application, surveying and mapping satellite application

Satellite Surveying and Mapping Application Center (SASMAC) is a technical institution under the National Administration of Surveying Mapping

and operation system, and related scientific research. Presently, SASMAC is mainly engaged in the construction of application system of ZY-3 satellite, China's first civilian stereo mapping satellite, research on key technology of satellite surveying and mapping application, application policies and specifications of ZY-3 satellite data, and development strategies and plans of surveying and mapping satellites, satellite application and emergency mapping.

## SBG SYSTEMS (Booth 53)

<b>Website:</b>	www.sbg-systems.com
<b>Address:</b>	3bis chemin de la jonchère, 92500 Rueil-Malmaison, France
<b>Contact:</b>	Thibault Bonnevie
<b>Email:</b>	sales@sbg-systems.com
<b>Telephone:</b>	+33 1 80 88 45 00



SBG Systems is a supplier of miniature, high performance, and cost-effective motion

sensors. It offers a complete line including Attitude and Heading Reference System (AHRS) and Inertial Navigation Systems with embedded GNSS receiver (INS/GNSS), etc.

Our sensors are ideal for mobile mapping and remote sensing applications, for camera/LiDAR stabilization and data georeferencing.

## SI IMAGING SERVICES (SIIS) (Booth 89)

<b>Website:</b>	www.si-imaging.com
<b>Address:</b>	SI Imaging Services, 441 expo-ro, Yuseong-gu, Daejeon, 305-714, Republic of Korea
<b>Contact:</b>	Sales team
<b>Email:</b>	sales@si-imaging.com
<b>Telephone:</b>	+82-42-341-0401



SI Imaging Services (SIIS) was founded in April 2014 as a subsidiary of Satrec Initiative (SI) with the mission of "Fair Access to Space". SIIS, which is specialized company in satellite imaging services, is exclusive distributor of

SI Imaging Services (SIIS) was founded in April 2014 as a subsidiary of Satrec Initiative

KOMPSAT-2 (1.0m optical), KOMPSAT-3 (0.55m optical), and KOMPSAT-5 (0.85m SAR) satellites imagery. SIIS has the global business network with more than 80 resellers and partners. In the capability of providing both optical and radar imagery as well as the collaborative business with worldwide network, SIIS offers better and fair imaging services to customers.

## SICHUAN BUREAU OF SURVEYING, MAPPING AND GEOINFORMATION (Booth 1)

<b>Website:</b>	www.scgis.org, http://www.scbsm.com/
<b>Address:</b>	ChengDu, JiuXing Road 7#, SiChuan Province
<b>Contact:</b>	Sun JingJie
<b>Email:</b>	153566140@qq.com
<b>Telephone:</b>	+86 13808202787



**SICHUAN ADMINISTRATION OF SURVEYING,  
MAPPING AND GEOINFORMATION**  
四川测绘地理信息局

Sichuan Bureau of Surveying, Mapping and Geoinformation, founded in 1960, is affiliated to National Administration of Surveying, Mapping and Geoinformation of China (NASG), and is the competent administrative department of Surveying, Mapping and Geoinformation in Sichuan. Sichuan Bureau undertakes national basic and major surveying and mapping missions assigned by NASG,

and fulfills the duty of provincial surveying and mapping management given by Sichuan provincial government. It has formed an integrated surveying and mapping service system that consists of geodetic surveying, photogrammetry and remote sensing, geoinformation system, underground pipeline surveying, engineering surveying, cadastral surveying, map compiling and publishing, surveying and mapping results management and supply, surveying and mapping products control and inspection, surveying and mapping technology education and training.

## SIMACTIVE (Booth 85)

<b>Website:</b>	<a href="http://www.simactive.com/">http://www.simactive.com/</a>
<b>Address:</b>	465 St-Jean, Suite 701, Montreal (Quebec) H2Y 2R6 Canada
<b>Contact:</b>	Abdaal Mazhar Shafi
<b>Email:</b>	<a href="mailto:amazhar@simactive.com">amazhar@simactive.com</a>
<b>Telephone:</b>	+1 514-288-2666

# simactive

SimActive is the developer of Correlator3DTM software, a patented end-to-end photogrammetry solution for the generation of high-quality geospatial data from satellite and aerial imagery, including UAVs. Correlator3DTM performs aerial triangulation(AT) and produces dense digital surface models (DSM), digital terrain models (DTM), point clouds,

orthomosaics and vectorized 3D features. Powered by GPU technology and multi-core CPUs, Correlator3DTM ensures matchless processing speed to support rapid production of large datasets. SimActive has been selling Correlator3DTM to leading mapping firms and government organizations around the world, offering cutting-edge photogrammetry software backed by exceptional customer support.

## SPHEREOPTICS GMBH (Booth 17)

<b>Website:</b>	<a href="http://www.sphereoptics.de">www.sphereoptics.de</a>
<b>Address:</b>	Gewerbestr. 13, 82211 Herrsching, Germany
<b>Contact:</b>	Dr. Andreas Eisele
<b>Email:</b>	<a href="mailto:aeisele@sphereoptics.de">aeisele@sphereoptics.de</a>
<b>Telephone:</b>	+49 1755 210 994



# SphereOptics

Since our formation in 2003, our goal has been to be much more than just a supplier of advanced equipment. Our mission is

to SERVE BETTER. Our technical experts are always standing-by when it comes to discussing standard or customer specific solutions in the areas of lighting technology, optical measurements service and remote sensing.

## STUDIO 727, S.R.O. (Booth 73-76)

<b>Website:</b>	www.727.sk
<b>Address:</b>	Elektrarenska 1, 831 04 Bratislava, Slovakia
<b>Contact:</b>	Ladislav Dedik
<b>Email:</b>	laco@727.sk
<b>Telephone:</b>	mobile: 00421 905624540, tel: 00421 249107111



Specialises in digitization and digital objects post production. In a short span of only 2

years, they have successfully captured more than 20 million pictures and scans and digitised more than 100000 objects of national cultural heritage, ranging from small jewellery up to castles and whole historic city districts.

## TERRA MESSFLUG (Booth 77)

<b>Website:</b>	?
<b>Address:</b>	?
<b>Contact:</b>	?
<b>Email:</b>	?
<b>Telephone:</b>	?



We are a leading company in the field of aerial survey and photogrammetry with more than 25 years of experience. Our services encompass consulting, flight planning, flight conduction and the production of a large variety of geodata.

We are a leading company in the field of aerial survey and photogrammetry

Our workflows and data processing chains are perfectly organised. As a result, customers' orders are completed efficiently and with highest quality. All our customers (e.g. national and regional authorities, municipalities, infrastructure providers, energy suppliers, ski resorts and universities) benefit from our reliability and prompt data delivery.

## TOPOL SOFTWARE (Booth 25)

<b>Website:</b>	www.topol.eu
<b>Address:</b>	Na Zlíchově 18, 152 00 Prague 5, Czech Republic
<b>Contact:</b>	Aleš Limpouch
<b>Email:</b>	topol@topol.cz
<b>Telephone:</b>	+420 251 563 003, +420 603 877 999



TopoL Software, founded in 1999, is an independent developer of geospatial software technologies. We offer general desktop and mobile GIS software, digital photogrammetric workstation and custom solutions for our

partners and customers around the world.

TopoL Software is the developer of PhoTopoL, a powerful photogrammetric workstation to process photogrammetric and GIS data. It supports data input and management, digital aerial triangulation, stereo editing, orthophoto rectification and mosaicking with colour

partners and customers around the world.



balancing.

TopoL Software also develops TopoL xT, a fully-functional general desktop GIS software, which enables users to collect, update,

manage, analyze and print spatial data in many industry-standard formats, and TopoL Mobile, an inexpensive mobile GIS solution for field data collection and navigation.

## TRACK'AIR BV, LEAD'AIR INC (Booth 33)

<b>Website:</b>	www.trackair.com
<b>Address:</b>	Lead'Air, Inc., 113 S Hoagland Blvd., Kissimmee, FL, 34741-4529, USA
<b>Contact:</b>	Rudi Fischer
<b>Email:</b>	rudi@trackair.com
<b>Telephone:</b>	+1 407-343-7571



For over 20 years Lead'Air Inc./Track'Air BV has been at the vanguard of innovation in Professional Flight Management Systems and Oblique Imaging Systems. Over a decade has passed since the inception of the highly touted MIDAS 5 Camera Oblique/ Vertical Mapping System and literally 10's of millions of images

have been captured with more systems in operation than any other in the world.

We offer a complete line of Flight Management Systems, IMU controlled Large and Small camera mounts for aerial LiDAR and Digital Acquisition as well as innovative new concept UAV Camera and Sensor Systems designed for all phases of professional photogrammetric applications.

## TRIMBLE (Booth 83)

<b>Website:</b>	www.trimble.com
<b>Address:</b>	Am Prime Parc 11, 65479 Raunheim, Germany
<b>Contact:</b>	Office team
<b>Email:</b>	geospatial@trimble.com
<b>Telephone:</b>	-



Trimble applies technology to make field and mobile workers in businesses and government more productive. Solutions are focused on applications requiring position or location—including surveying, construction, agriculture, fleet and asset management, utilities, public

safety and mapping. In addition to utilizing positioning technologies, such as GPS, lasers and optics, Trimble solutions include software content specific to the needs of the user. Wireless technologies are utilized to deliver the solution to the user and to ensure a tight coupling of the field and the back office. Founded in 1978, Trimble is headquartered in Sunnyvale, California and has offices around the world.

## TWENTY FIRST CENTURY AEROSPACE TECHNOLOGY CO., LTD. (Booth 60)

<b>Website:</b>	www.21at.com.cn/en/
<b>Address:</b>	No. 26 Jiancaicheng East Road, Haidian District, Beijing, China 100096
<b>Contact:</b>	Mr. Yin Hu
<b>Email:</b>	huyin@21at.sg
<b>Telephone:</b>	0086 10 62929966-8004

Twenty First Century Aerospace Technology Co., Ltd. (21AT) is the only commercial EO satellite operator based in Beijing, China and has more than 300 employees. Since 2001, the company has been providing EO data and value added service in China. The company has the following EO satellite resources: 4m Beijing-1, launched in 2005 and three 1m

identical satellite constellation--TripleSat Constellation, launched on 10 July 2015. 21AT had been providing Beijing-1 data to international customer through Disaster Monitoring Constellation (DMC) and disaster response through International Charter; and is providing TripleSat Constellation daily imaging service to worldwide customers.

## VEXCEL IMAGING (Booth 50)

<b>Website:</b>	iFlyUltrCam.com
<b>Address:</b>	Anzengruebergasse 8, Graz 8010, Austria
<b>Contact:</b>	Silke Kemmer
<b>Email:</b>	i-sikemm@microsoft.com
<b>Telephone:</b>	+43316849066



Vexcel Imaging, based in Graz (Austria), taps into more than two decades of photogrammetry expertise offering state-of-the-art digital sensor systems based on the latest and most-advanced technology. The comprehensive aerial camera portfolio provides a wide range of imaging capabilities from wide-area mapping (UltraCam Condor)

to nadir (UltraCam Eagle & UltraCam Falcon) and oblique (UltraCam Osprey product line) camera systems. On the terrestrial side are the car-based mobile mapping system UltraCam Mustang and the UltraCam Panther portable 3D reality capture system (currently under redesign). The system family is complemented by the fully integrated processing software UltraMap delivering exceptional quality point clouds, DSMs and ortho imagery.

## VISIONMAP (Booth 81)

<b>Website:</b>	www.visionmap.com
<b>Address:</b>	19D Habarzel St., Tel Aviv, Israel 6971025
<b>Contact:</b>	Dr. Yuri Raizman
<b>Email:</b>	info@visionmap.com
<b>Telephone:</b>	+972-3-6091042



Founded in 2004, VisionMap is a leading manufacturer of state-of-the-art digital mapping systems. VisionMap's innovative data acquisition and automatic processing systems set a new standard for productivity in geospatial data production.

Thanks to VisionMap's proprietary imaging technology, the cameras are able to collect vertical and oblique imagery of an area simultaneously, and quickly cover vast areas in extremely high resolution. VisionMap's systems support extremely large-scale projects thanks to their fast turnaround time.

VisionMap's systems collect complementary color and thermal images, and provide final products such as aerial triangulation, DSM, Orthophoto mosaic, stereo models and geo-referenced oblique images in a seamless workflow.

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PROGRAM XXIII ISPRS  
VENUE FLOOR PLANS

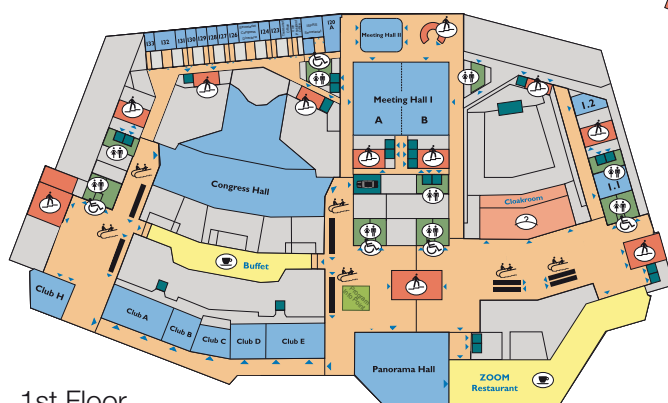




## VENUE FLOOR PLANS



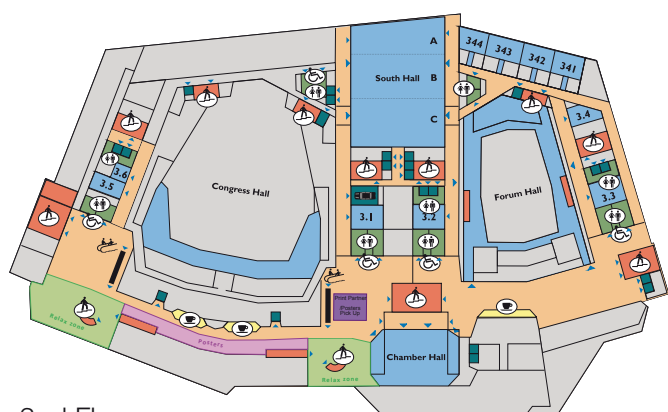
Ground Floor



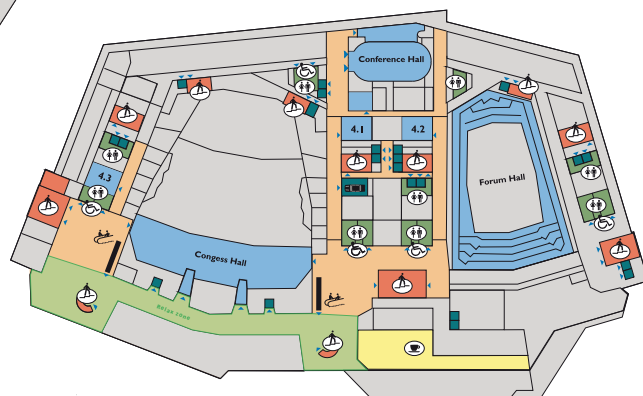
1st Floor



2nd Floor



3rd Floor



4th Floor

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## Topics covered:

- |                                   |                                     |                                     |                                       |
|-----------------------------------|-------------------------------------|-------------------------------------|---------------------------------------|
| ✓ 3D Visualisation/Modelling      | ✓ DTM - Digital Terrain Model       | ✓ Hyperspectral Imaging             | ✓ Radio Navigation                    |
| ✓ Addressing Technology           | ✓ Dynamic Mapping                   | ✓ Image Analysis                    | ✓ Remote Sensing                      |
| ✓ Aerial Imagery/Photography      | ✓ Earth Observation                 | ✓ INSPIRE                           | ✓ Risk Management                     |
| ✓ Asset Management                | ✓ Emergency Services                | ✓ Integration                       | ✓ RTK (Real Time Kinematic) Surveying |
| ✓ Bathymetry                      | ✓ ENC - Electronic Navigation Chart | ✓ Interoperability & Open Standards | ✓ Satellite Imagery/Navigation        |
| ✓ Big Data                        | ✓ Environmental Monitoring          | ✓ Land Information Systems          | ✓ Scanning Technology                 |
| ✓ Business Geographics/ Analytics | ✓ Galileo                           | ✓ Laser Scanning                    | ✓ SDI - Spatial Data Infrastructures  |
| ✓ Cadastral Mapping               | ✓ Geo-ICT                           | ✓ LBS                               | ✓ Smart Grids                         |
| ✓ Cartography                     | ✓ Geodesy                           | ✓ LiDAR                             | ✓ Software                            |
| ✓ Climate Change                  | ✓ Georeferencing                    | ✓ Mapping Software                  | ✓ Surveying Instrumentation           |
| ✓ Computing in the Cloud          | ✓ Geosciences                       | ✓ Marine Tracking & Navigation      | ✓ Surveying Technology Sensor         |
| ✓ Crime Mapping/ Modelling        | ✓ Geospatial Image Processing       | ✓ Mobile GIS/Mapping                | ✓ Telematics                          |
| ✓ Data Capture/Collection         | ✓ GIS                               | ✓ Municipal GIS                     | ✓ Topographic Mapping                 |
| ✓ DEM- Digital Elevation Model    | ✓ GIS in Agriculture & Forestry     | ✓ Navigation                        | ✓ Total Station                       |
| ✓ DGPS - Differential GPS         | ✓ GLONASS                           | ✓ Network Topology                  | ✓ Tracking & Route Planning           |
| ✓ Digital City Models             | ✓ GMES                              | ✓ NSDI                              | ✓ Transport                           |
| ✓ Digital Mapping                 | ✓ GNSS                              | ✓ Open GIS                          | ✓ Utilities GIS                       |
| ✓ Digital Rights Management       | ✓ GPS                               | ✓ Photogrammetric                   | ✓ Vehicle Tracking & Navigation       |
| ✓ Disaster Management/ Monitoring | ✓ GSDI                              | ✓ Photogrammetry                    | ✓ VRS - Virtual Reference Station     |
| ✓ DSM - Digital Surface Model     | ✓ Hardware                          | ✓ Point Clouds                      | ✓ Web Mapping                         |
|                                   | ✓ Hydrography                       | ✓ Property Information Systems      |                                       |

## Sectors covered:

- |                                     |                            |                               |                              |
|-------------------------------------|----------------------------|-------------------------------|------------------------------|
| ✓ Aerospace                         | ✓ Defence                  | ✓ Healthcare                  | ✓ Public Safety/Works        |
| ✓ Agriculture                       | ✓ Education                | ✓ Infrastructure Protection   | ✓ Retail                     |
| ✓ Archaeology & Heritage            | ✓ Emergency Services       | ✓ Insurance                   | ✓ Shipping                   |
| ✓ Architecture                      | ✓ Energy Utility           | ✓ Manufacturing               | ✓ Software Development       |
| ✓ Biosecurity                       | ✓ Engineering              | ✓ Marine                      | ✓ Technical Services         |
| ✓ Business Security/Service         | ✓ Environmental Management | ✓ Military                    | ✓ Telecommunications         |
| ✓ Central/Local/Regional Government | ✓ Environmental Monitoring | ✓ Mining                      | ✓ Tourism/Travel             |
| ✓ Construction                      | ✓ Financial Services       | ✓ Natural Resource Management | ✓ Training                   |
| ✓ Consulting Services               | ✓ Fisheries                | ✓ Oil & Gas                   | ✓ Transport                  |
| ✓ Cyber Security                    | ✓ Forestry Management      | ✓ Property                    | ✓ Utilities (Energy & Water) |
|                                     | ✓ Geosciences              |                               |                              |

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## GENERAL INFORMATION

### Accommodation

For any queries about Accommodation, please, contact our Accommodation Partner C-IN:

C-IN, s.r.o.

Prague Congress Centre

5. května 65

140 21 Prague 4

Czech Republic

Tel.: +420 261 174 301

Email: hotels.isprs2016-prague@c-in.eu

### Airport

Vaclav Havel Airport Prague is located around 45 minutes by car from the Prague Congress Centre.

There are two ways how to get to the Prague Congress Center by public transport (Metro station Vysehrad):

1) You can take bus number 119 from the Vaclav Havel Airport and go to Nadrazi Veleslavin metro station (green line). Then you take the metro to Muzeum metro station where you have to change the line for the red one. You have to go in the direction of Haje and get off in Vysehrad metro station where the Prague Congress Center is located.

2) You can take the Airport Express bus to Hlavni nadrazi (Prague main station) and then just take the metro (red line, direction Haje) and get off in Vysehrad.

There will be two stands of ISPRS Congress at the airport from 10.7. to 12. 7. 2016 (in the arrival hall of Terminal 1, as well as in Terminal 2) where you can ask for any information needed.

### ATM

An ATM is located between the entrances No. 5 and 6 of the Congress Center. There is

also another ATM right next to the entrance of metro station Vysehrad

### Badge

Along with your registration, you will be given your own badge that must be worn when attending all the sessions in Prague Congress Centre. Delegates without the badge will not be allowed to enter the Prague Congress Centre. In case of loss of your badge, you can ask for a new badge that will be given to you for a handling fee of 10 euros. Your original badge will be blocked.

### Certificate of Attendance

All registered delegates are entitled to receive a Certificate of Attendance. You can also ask for it after the Congress by sending a request to [info@isprs2016-prague.com](mailto:info@isprs2016-prague.com)

### Cloakroom

A cloakroom is located on the ground floor of the Congress Center. This service is free of charge for all participants.

### Congress Application

Download the "ISPRS 2016 Prague Attendee App" from your store, available for Android, iOS, Windows and Blackberry. This official Congress Application will keep you organized during the congress. Within the app, you can view the entire program, plan your own schedule and make direct contact with colleagues at the congress.

### Currency

Currency of the Czech Republic is the Czech Crown (CZK). However, Euro is accepted in many restaurants, hotels and shops. Payment with credit card is always a

solution. Exchange rates are approximately 27 CZK/EUR and 24 CZK/USD. For more detailed information, please check the actual exchange rates. Czech banknotes are issued in the following denominations: 100/200/500/1000/2000/5000 CZK. Coins are denominated: 1/2/5/10/20/50 CZK.

## Electricity

The voltage is 220 V with frequency of 50 KHz.

## Emergency calls

Fire Department	150
General Emergency	112
Medical Services	155
Police	158

## First Aid

First Aid station is located on the ground floor of the Venue.

The nearest clinic is Poliklinika Budejovicka which is located at the Budejovicka metro station (red line).

[www.poliklinika-budejovicka.cz](http://www.poliklinika-budejovicka.cz)

Poliklinika Budějovická  
Antala Staška 1670/80  
140 00 Praha 4

Reception desk: + 420 261 006 111

## Gala dinner

Gala dinner will be held in Zofin Palace. Black tie dress code is required.

Zofin Palace Address:

Slovanský ostrov 226

11000 Prague

You can take the metro from Vysehrad metro station (red line) to I. P. Pavlova metro station (in the direction of Letnany). You should change the metro for the tram nb. 22 to Narodni divadlo (National theatre). Zofin Palace is situated about 200 meters from the tram stop.

## Information about Prague

For more information about Prague or Czech Republic, please, visit these websites:

[www.prague.cz](http://www.prague.cz)

[www.prague-czechrepublic.com](http://www.prague-czechrepublic.com)

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

[www.praguemorning.cz](http://www.praguemorning.cz)

[www.czech.cz/en/Home-en](http://www.czech.cz/en/Home-en)

## Insurance

We strongly recommend participants to carry travel and health insurance.

Insurance is not included in the Congress fee.

## Language

The official language of the Event is English. No simultaneous translation is provided.

## Liability Disclaimer

ISPRS Prague 2016 Organizers have taken all reasonable care in making arrangements for the Congress. In the event of unforeseen disruptions, neither ISPRS neither SFDP nor their agents can be held responsible for any losses or damages incurred by delegates. The program is correct at the time of printing, but organizers reserve the right to alter the program if and when deemed necessary. ISPRS Prague 2016 Organizers shall in no event be liable for acts or omissions in the event of injury, damage, loss, accident, delay or irregularity of any kind whatsoever during arrangements organized through contractors or by the employees of such contractors. Delegates should make their own arrangements with respect to personal insurance. ISPRS Prague 2016 Organizers reserve the right to make changes as and when deemed necessary without prior notice to the parties concerned. All disputes are subject to resolution under Czech Law.



## Parking

An underground parking space is available in the Congress Centre; however, the parking fee is not included in the registration fee.

## Pharmacy

The nearest pharmacy is located in the shopping center Arkady Pankrac – 2 underground stations from Vysehrad metro station.

For more information go to: [www.lekarnapankrac.cz](http://www.lekarnapankrac.cz)

## Prague Congress Centre

Address of the venue:

5. května 65  
140 21 Prague 4, Czech Republic  
630 80 249

Metro station: Vysehrad (red line, C)

## Prague public transport

All delegates will be given a free public transport ticket valid for the period of the whole event (12-19 July 2016). Available at registration desk.

### Metro/Underground

The Metro operates daily from 05:00 to 24:00. It is the fastest way of moving around the city. The Metro network consists of 3 lines: A-green color, B – yellow color, C – red color.

### Trams and Buses

Trams and buses operate 24 hours a day.

Night trams and buses operate from 00:30 – 4:30 with traffic intervals of approximately 30 minutes.

For more information go to: [www.dpp.cz](http://www.dpp.cz)

## Preparation of Presentations

Please hand in your presentation 2 hours in advance in the Speakers preview room on the second floor in the Meeting room 2.1.

## Registration Fee Entitlements

### Basic

Entry to all sessions  
Attendance at Welcome Reception  
Copy of Final Program  
Digital Copy of Proceedings  
Entry to the Exhibition  
Morning and Afternoon Coffee&Tea  
Attendance at the Exhibitor's Reception  
Public transport ticket

### Standard

Basic Registration Fee + Lunch Each Day of the Congress

### Full

Standard Registration Fee + Attendance at the Congress Gala Dinner

### Day registration

Entry to all sessions on the day of registration  
Copy of Final Program  
Entry to the Exhibition  
Morning and Afternoon Coffee&Tea for one day  
Attendance at the Exhibitors' Reception  
Public transport ticket

### Accompanying persons

Access to the Exhibition  
Attendance at the Welcome Reception  
Attendance at the Opening Ceremony  
Attendance at the Closing Ceremony  
Attendance at the Exhibitor's Reception  
Morning and Afternoon Coffee&Tea

## Safety

Prague is one of the safest destinations in Europe. Nevertheless, we strongly recommend you to pay a special attention to all your personal belongings.

## Smoking Policy

Please note that smoking is not permitted anywhere within the Prague Congress Center. It is also usually forbidden to smoke in restaurants between 12 and 14 pm.

## Taxi

It is very easy to get a Taxi in the city center. However, we recommend you to use hotel taxis or obtain taxis by phone through the taxi services:

AAA + 420 14 014

City taxi + 420 257 257 257

Nejlevnější taxi + 420 226 000 226

Boarding charge is approximately 30 CZK. Please be careful to fraudulent taxi services and always ask in advance about the boarding charge.

## Time

Czech time is GMT +1 hour, in summer GMT + 2 (summer time).

## Tipping

In all restaurants and bars tips are welcome. If you consider the service good enough to leave a tip, suggested level is around 10 %.

## Wi-Fi

Free Wi-Fi internet connection is available in the Prague Congress Center building.

## Official Congress Phone Number

+ 420 773 877 074



NEW

## Leica ALS80-UP Airborne reality capture

Leica ALS80-UP provides greater maximum flying heights and stronger signals at mid-range heights. This allows higher Multiple Pulse in Air (MPiA) settings and enables data collection in extreme terrain with minimal swath width variation due to elevation relief, and increases flight line spacing. Typical applications include wide area mapping and detail mapping from high flying heights over mountainous areas.



### Fast & flexible airborne LiDAR sensor

Visit [www.leica-geosystems.com](http://www.leica-geosystems.com) for more information or to request a demo.

PRAGUE, CZECH REPUBLIC  
12- 19 JULY 2016

| ISPRS |

LEICA GEOSYSTEMS  
BOOTH 42-49, FLOOR 2

Leica Geosystems AG

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- when it has to be **right**

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