



# ISPRS TECHNICAL COMMISSION V SYMPOSIUM

## 23-25 JUNE 2014 - RIVA DEL GARDA, ITALY

|             | <b>SUNDAY<br/>JUNE 22<sup>nd</sup></b>                      |   | <b>MONDAY<br/>JUNE 23<sup>RD</sup></b> |  |   | <b>TUESDAY<br/>JUNE 24<sup>TH</sup></b>               |  |  | <b>WEDNESDAY<br/>JUNE 25<sup>TH</sup></b>                 |  |   |
|-------------|---|---|--|--|---|---|--|--|---|--|---|
| 8:45-10:30  | <b>REGISTRATION</b>   | <b>TUTORIALS</b>  | <b>CIPA EXEC BOARD MEETING</b>         | PLENARY SESSION<br><b>Opening &amp; Keynotes</b><br>(Room 1000)            |   |   | PLENARY SESSION<br><b>Keynote &amp; ARIDA session</b><br>(Room 1000) |  |   | PLENARY SESSION<br><b>Keynotes</b><br>(Room 1000)  |   |
| 10:30-11:15 |   |   |  | COFFEE BREAK<br>& POSTERS  |   |   | COFFEE BREAK<br>& POSTERS  |  |   | COFFEE BREAK<br>& POSTERS  |   |
| 11:15-13:00 |   |   |  | PARALLEL SESSIONS  |   |   | PARALLEL SESSIONS  |  |   | PARALLEL SESSIONS  |   |
|             |   |   |  | TS WG 1 –<br>Camera calibration<br>& network<br>orientation<br>(Room 1000) | Joint TS WG3 & WG4 –<br>Point cloud<br>segmentation and<br>modeling<br>(Room 300) |   | TS ICWG<br>1/5a - <b>MMS</b><br>data<br>processing<br>(Room 1000)    | TS ICWG<br>1/5b - <b>UAV</b><br>for Earth<br>observation<br>(Room 300) | Workshop<br><b>MayaArch3D</b><br>project<br>(Belvedere)   | Joint TS WG3 &<br>WG5 – <b>Forestry</b><br>(Room 1000)                                   | TS WG2 –<br><b>3D</b><br>modeling &<br><b>CH</b><br>(Room 300)                          |
| 13:00-14:00 |   |   |  | LUNCH BREAK  |   |   | LUNCH BREAK  |  |   | LUNCH BREAK  |   |
| 14:00-14:45 |   |   |  | POSTERS  |   |   | POSTERS  |  |   | POSTERS  |   |
| 14:45-16:15 |   |   |  | PARALLEL SESSIONS  |   |   | PARALLEL SESSIONS  |  |   | PARALLEL SESSIONS  |   |
|             |   |   |  | TS WG5 -<br><b>Earth</b><br>application<br>(Room<br>1000)                  | TS WG2 -<br><b>Documenting</b><br><b>CH</b><br>(Room 300)                         | Workshop<br><b>COSCH EU</b><br>project<br>(Belvedere) | TS WG3 -<br><b>Calibration</b><br>of range<br>sensors<br>(Room 1000) | TS WG4 &<br>WG2 - <b>BIM</b><br>& <b>CH</b><br>(Room 300)              | Workshop 3D-<br><b>ICONS EU</b><br>project<br>(Belvedere) | Joint TS WG1 &<br>WG4 -<br><b>Image matching</b><br>& <b>point clouds</b><br>(Room 1000) | TS WG4 -<br><b>Automation in</b><br><b>3D modeling &amp;</b><br><b>VR</b><br>(Room 300) |
| 16:15-17:00 |   |   |  | COFFEE BREAK<br>& POSTERS  |   |   | COFFEE BREAK<br>& POSTERS  |  |   | PLENARY SESSION<br>Awards & Closing<br>(Room 1000)                                       |   |
| 17:00-18:00 | PARALLEL SESSIONS   |   |  | PARALLEL SESSIONS  |   |   | PARALLEL SESSIONS  |  |   |  |   |
|             | TS WG4 -<br><b>Smartphone 3D</b><br>modeling<br>(Room 1000) | Joint TS WG2 & ICWG 1/5b<br>– <b>UAV photogrammetry</b><br>(Room 300) |  | TS WG3 - <b>Range</b><br>data analysis &<br>processing<br>(Room 1000)      | TS WG1 – <b>Metrology and</b><br>deformation studies<br>(Room 300)                |   |  |  |   |  |   |
| 19:30       | <b>WELCOME PARTY @ ROCCA</b>                                |   |  | <b>SOCIAL DINNER @ PALAMEETING</b>   |   |   |  |  |   |  |   |

## **MONDAY, June 23<sup>rd</sup>**

### **8:45-10:30 - PLENARY SESSION - Room 1000**

- Opening remarks
- **KEYNOTE1**: Structure from motion: state of the art, examples and open issues - the Computer Vision perspective - A. Fusiello (University of Udine, Italy)
- **KEYNOTE2**: Dense image matching and surface reconstruction: when photogrammetry meets computational geometry - F. Lafarge (INRIA, France)

### **COFFEE BREAK & POSTERS**

#### **11:15-13:00 PARALLEL SESSIONS**

##### **Room 1000**

##### **TS WG 1 - Camera calibration & network orientation**

**Chairman: T. Luhmann**

- Camera Calibration using the damped Bundle Adjustment toolbox  
*N. Börlin and P. Grussenmeyer*
- Automatic label completion for testfield calibration  
*J. Hieronymus*
- Automated target-free network orientation and camera calibration  
*C. Stamatopoulos and C. S. Fraser*
- Effect of lossy JPEG compression of an image with chromatic aberrations  
*R. Matsuoka*
- Multispectral calibration to enhance the metrology performance of off the shelf C mount camera systems  
*S. Robson, L. MacDonald, S.A. Kyle and M.R. Shortis*

##### **Room 300**

##### **Joint TS WG3 & WG4 - Point cloud segmentation and modeling**

**Chairman: M. Scaioni**

- Extracting rail track geometry from static terrestrial laser scans for monitoring purposes  
*A. Soni, S. Robson and B. Gleeson*
- Terrestrial laser scanning for geometry extraction and change monitoring of rubble mound breakwaters  
*I. Puente, R. Lindenbergh, H. González-Jorge and P. Arias*
- Segmentation of planar surfaces in LiDAR point clouds of an electrical substation by exploring the structure of points neighbourhood  
*M. Arastounia and D.D. Lichti*
- Performance of parameter-domain and spatial-domain pole-like features segmentation using single and multiple terrestrial laser scans  
*Z. Lari, K. Al-Durgham and A. Habib*
- A new framework for interactive segmentation of point clouds  
*K. Liu and J. Boehm*

### **LUNCH BREAK & POSTERS**

#### **14:45-16:15 PARALLEL SESSIONS**

##### **Room 1000**

##### **TS WG5 - Earth applications**

**Chairman: D. Rieke-Zapp**

- Reconstructing 3D coastal cliffs from airborne oblique photographs without ground control points  
*T. Dewez*
- Landslide monitoring by fixed-base terrestrial stereo-photogrammetry  
*R. Roncella, G. Forlani, M. Fornari and F. Diotri*
- An autonomous image based approach for detecting glacial lake outburst floods  
*R. Koschitzki, E. Schwalbe, H.-G., Maas*
- How to decide which oblique image has the highest mapping potential for monoplotted method: a case studies on river erosion and floods  
*M. Triglav-Cekada, V. Bric and M. Zorn*

##### **Room 300**

##### **TS WG2 - Documenting Cultural Heritage**

**Chairman: F. Rinaudo**

- Accuracy of typical photogrammetric networks in cultural heritage 3D modeling projects  
*E. Nocerino, F. Menna and F. Remondino*
- Investigation on the automatic geo-referencing of archaeological UAV photographs by correlation with pre-existing ortho-photos  
*W. Karel, M. Doneus, C. Briese, G. Verhoeven and N. Pfeifer*
- Can 3D point clouds replace GCPs?  
*G. Stavropoulou, G. Tzovla, A. Georgopoulos*
- Integration of image- and range-based techniques for surveying complex architectures  
*M. Russo and A.M. Manferdini*

##### **Room Belvedere**

##### **Workshop COSH EU project**

**Chairman: F. Boochs**

- COSCH - a Cost Action bridging technology and user interests in optical documentation of Cultural Heritage objects  
*F. Boochs (Mainz Univ., Germany)*
- COSCH knowledge representation using semantic technologies to link optical techniques and user needs  
*A. Karmacharya (Mainz Univ., Germany)*
- The engineers viewpoints within COSCH knowledge representation  
*A. Tremeau (St. Etienne, France)*
- The users viewpoints within COSCH knowledge representation  
*O. Murphy (Cork, Ireland)*

### **COFFEE BREAK & POSTERS**

## 17:00-18:00 PARALLEL SESSIONS

### Room 1000

#### TS WG4 - Smartphone 3D modeling

Chairman: F. Menna

- An ISVD-based Euclidian structure from motion for smartphones  
*A. Masiero, A. Guarnieri, A. Vettore and F. Pirotti*
- Accuracy assessment of building point clouds automatically generated from iPhone images  
*B. Sirmacek and R. Lindenbergh*
- Development of a self-localization method using sensors on mobile devices  
*T. Fuse and K. Matsumoto*

### Room 300

#### Joint TS WG2 & ICWG 1/5b - UAV photogrammetry

Chairman: F. Nex

- UAV-based photogrammetry: monitoring of a building zone  
*J. Unger*
- UAV archaeological reconstruction: The case of study of Chamartin Hillfort (Avila, Spain)  
*D. Gonzales-Aguilera, A. Muñoz-Nieto, P. Rodriguez-Gonzalvez, J. Fernandez-Hernandez, J. Gomez-Lahoz, I. Picon-Cabrera, J.S. Herrero-Pascual and D. Hernandez-Lopez*
- UAV data processing for large scale topographical mapping  
*W. Tampubolon*

## POSTERS (WG2 & WG5)

- A new approach for documentation, conservation and preservation of the Monolithic statues in San Agustín as pilot for outdoor Cultural Heritage documentation in Colombia - A. Estela and J. Hamacher
- Paleovalleys mapping using remote sensing - A. Baibatsha
- Automatic extraction of sectional view from point clouds. The case of Ottmarsheim's abbey-church - T. Landes and S. Bidino
- 2.5D/3D Models for the enhancement of architectural-urban heritage. An Virtual Tour of design of the Fascist headquarters in Littoria - E. Ippoliti, M. Calvano and L. Mores
- Image-based 3D modeling for the knowledge and the representation of archaeological dig and pottery: Sant'Omobono and Sarno project's strategies - S. Gianolio, F. Mermati and G. Genovese
- Evaluations of three-dimensional building model reconstruction from LiDAR point clouds and single-view perspective imagery - F. Tsai and H. Chang
- A new approach towards image based virtual 3D city modeling by using close range photogrammetry - S.P. Singh, K. Jain and V.R. Mandla
- Accuracy of cultural heritage 3D models by RPAS and terrestrial photogrammetry - M. Bolognesi
- Airborne Laser Scanning and image processing techniques for archaeological prospection - M. Faltýnová and P. Nový
- Geoarchaeological site documentation and analysis of 3D data derived by terrestrial laser scanning - D. Hoffmeister, S. Zellmann, K. Kindermann, A. Pastoors, U. Lang, O. Bubenzer, G-C. Weniger and G. Bareth
- Recovering a collapsed medieval fresco by using 3D modeling techniques - F. Rinaudo and F. Chiabrando
- Image based 3D city modeling: comparative study - S.P. Singh, K. Jain and V.R. Mandla
- 3D painting documentation: evaluation of conservation conditions with imaging and ranging techniques - D. Abate, F. Menna, F. Remondino and M.G. Gattari
- Discovering hidden architectures of ancient time: 3d data survey to reveal the myth of mithra in Santa Maria Capua Vetere - M. Campi, R. Catuogno, A. Di Luggo, D. Iovane and D. Palomba
- Integration of three dimensional data from unknown origin on the example of a traditional residential building in Al-Bala, Jeddah, Saudi Arabia – I. Mayer, U. Herbig and S. Rasztoivts
- 3D Modeling by consolidation of independent geometries extracted from point clouds. The case of the modeling of the Turckheim's Chapel (Alsace, France) - M. Koehl, P. Fabre and B. Schlüssel
- Fusion of 3D models derived from TLS and image-based techniques for CH enhanced documentation - P. Bastonero, E. Donadio, F. Chiabrando and A. Spanò
- Photogrammetry and laser as 3D documentation methods for cultural heritage - R. Radi and SH. Sayed
- Photogrammetry applied to problematic artefacts – C. Nicolae, E. Nocerino, F. Menna and F. Remondino
- The sanctuary of Punta Stilo at Kaulonia-Monasterace (Rc, Italy): preliminary results of the close range photogrammetric surveys 2012-2013 - E. Taccola, M.C. Parra and C. Ampolo
- The documentation and reintegration of a lost past – C. Balletti, C. Gottardi, F. Guerra and N. Brussa
- Towards akKnowledge model bridging technologies and applications in Cultural Heritage documentation - F. Boochs, A. Tremeau, O. Murphy, M. Gerke, J.L. Lerma, A. Karmacharya and M. Karaszewski
- The city model as a tool for participatory urban planning - a case study: the Bilotti open air museum of Cosenza - S. Artese
- Photogrammetric applications of immersive video cameras - K. Kwiatek and R. Tokarczyk
- Methods and tools to enjoy and to study inaccessible Heritage - M. Capone, M. Campi and A. di Luggo
- A comparison of multi-view 3D reconstruction of a rock wall using several cameras and a laser scanner - K. Thoeni, A. Giacomini, R. Murtagh and E. Kniest
- Water surface and velocity measurement-river and flume - J. Chandler, E. Ferreira, R Wackrow and K Shiono
- Human vision pathology diagnostics by photogrammetric means - Murynin, I. Mateev and V. Knyaz
- Face pose recognition based on monocular digital imagery and stereo-based estimation of its precision - V. Gorbatsevich and Yu. Vizilter
- Customized 3D modeling of augmentation mentoplasty - R. Guryanov and A. Guryanov
- Fast, accurate procedure for identifying the current pose of an intramedullary nail relative to a surgical c-arm x-ray unit - H. Esfandiari, S. Amiri, D. Lichti and C. Anglin
- 3D Technologies in Plastic Surgery - R. Guryanov and A. Guryanov
- Area-wide mapping of phenology using optical high resolution satellite imagery – phenoSAT - M. Rutzinger, M. Bremer, K. Schmidtner

## TUESDAY, June 24<sup>th</sup>

### 8:45-10:30 - PLENARY SESSION - Room 1000

- **KEYNOTE3:** Do we need the full 3D reconstruction pipeline? – M. Wimmer (TU Vienna, Austria)
- ARIDA Special Session – talk#1: From parallax to parallax: The importance of parallax in triplet calibration and matching – H. Chikatsu (Tokyo Denki University, Japan)
- ARIDA Special Session – talk#2: UAVs in Geomatics - a technology in transition – A. Gruen (ETH Zurich, Switzerland)
- ARIDA Special Session – talk#3: Automated orientation & object reconstruction in close-range photogrammetry: prospects and limitations – C. Fraser (Melbourne Univ., Australia)

### COFFEE BREAK & POSTERS

#### 11:15-13:00 PARALLEL SESSIONS

##### Room 1000

##### TS ICWG 1/5a - MMS data processing

Chairman: J. Li

- Geometric road runoff estimation from laser mobile mapping data  
*J. Wang, H. Gonzalez-Jorge, R. Lindenbergh, P. Arias-Sanchez and M. Menenti*
- Generation of effective orthophoto for road surface using MMS  
*D. Yagishita and H. Chikatsu*
- Monitoring marginal erosion in hydroelectric reservoirs with terrestrial mobile laser scanner  
*A.M.G. Tommaselli, M.V.A. Moraes, L.S.L. Silva, M.F. Rubio, G.J. Carvalho and J.T.G. Tommaselli*
- Automatic road sign detection and classification based on support vector machines and HOG descriptors  
*A. Adam and C. Ioannidis*
- Skyline matching based camera orientation from images and mobile mapping point clouds  
*S. Hofmann, D. Eggert and C. Brenner*

##### Room 300

##### TS ICWG 1/5b - UAV for Earth observation

Chairman: G. Grenzdörffer

- Assessing UAV platform types and optical sensor specifications  
*B. Altena and T. Goedemé*
- Evaluation of DEM generation accuracy from UAV imagery  
*M. Santise, G. Forlani and R. Roncella*
- LiDAR-equipped UAV for building information building  
*D. Roca, J. Armesto, S. Lagüela and L. Díaz*
- Bridging Gaps!? Combined UAV photogrammetry and TLS in archaeological projects  
*M. Schaich*
- Automated true-orthophoto generation from UAV images  
*L. Barazzetti, R. Brumana, D. Oreni, M. Previtali and F. Roncoroni*

##### Room Belvedere

##### Workshop MayaArch3D project

Chairman: M. Reindel

- MayaArch3D project overview and aims  
*M. Reindel & J. von Schwerin (DAI, Germany)*
- Terrestrial data acquisition and 3D modeling for the MayaArch3D project  
*B. Jimenez (FBK, Italy)*
- 3D models post-processing: segmentation, structuring and database generation  
*J. von Schwerin & M. Lyons (DAI, Germany)*
- 3D Geodatabase modelling and the MayaArch3D geobrowser  
*L. Loos (Heidelberg Univ., Germany) & G. Agugiaro (AIT, Austria)*
- New approaches for 3D WebGIS applications in Cultural Heritage  
*A. Zipf & M. Auer (Heidelberg Univ., Germany)*

### LUNCH BREAK & POSTERS

#### 14:45-16:15 PARALLEL SESSIONS

##### Room 1000

##### TS WG3 - Calibration of range sensors

Chairman: R. Lindenbergh

- A flexible self-calibration for laser scanning range finders  
*P. Westfeld, D. Mader and H.-G. Maas*
- Self-calibration of terrestrial laser scanners: selection of the best geometric additional parameters  
*J.L. Lerma and D. García-San-Miguel*
- Analysis and correction of the dependency between laser scanner intensity values and range  
*R. Blaskow and D. Schneider*
- Kinect Fusion improvement using depth camera calibration

##### Room 300

##### TS WG4 & WG2 - BIM & Cultural Heritage

Chairman: T. Fuse

- Survey turned into HBIM: the restoration and the work involved concerning the Basilica di Collemaggio after the earthquake (L'Aquila)  
*L. Barazzetti, R. Brumana, D. Oreni, S. Della Torre, F. Banfi and M. Previtali*
- 3D Modelling of interior spaces: learning the language of indoor architecture  
*K. Khoshelham and L. Díaz-Vilariño*
- Indoor modelling benchmark for 3D geometry extraction  
*C. Thomson and J. Boehm*

##### Room Belvedere

##### Workshop 3D-ICONS EU project

Chairman: G. Guidi

- 3D digitization of bronze and gold artefacts from Romanian National History Museum's collections  
*C. Nicolae, MNIR, Romania*
- The 'Rubble of the North' - a solution for modelling the irregular architecture of Ireland's historic monuments  
*R. Shaw, Discovery Programme, Ireland*
- Digitisation, processing and visualisation of monuments within the 3D-ICONS framework: The case of Athena RC  
*A. Koutsoudis, Athena RIC Centre, Greece*
- Analysis of the 3D reconstruction methodologies used within the framework of the 3D-ICONS project

D. Pagliari, F. Menna, R. Roncella, F. Remondino and L. Pinto

- Establishing an appropriate Level of Detail (LoD) for a Building Information Model (BIM)  
*J. Rafeiro and S. Fai*

L. De Luca, CNRS, France

- The last mile of 3DIcons: making available 3D contents and their metadata through Europeana  
*S. Gonizzi, Politecnico di Milano, Italy*

## COFFEE BREAK & POSTERS

### 17:00-18:00 PARALLEL SESSIONS

#### Room 1000

##### TS WG3 - Range data analysis & processing

Chairman: F. Pirotti

- Error analysis of motion correction method for LS of moving objects  
*S. Goel and B. Lohani*
- Localization using RGB-D cameras orthoimages  
*M.-A. Mittet, T. Landes and P. Grussenmeyer*
- Towards automatic indoor reconstruction of cluttered building rooms from point clouds  
*M. Previtali, M. Scaioni, L. Barazzetti and R. Brumana*

#### Room 300

##### TS WG1 - Metrology and deformation studies

Chairman: M. Shortis

- Eccentricity in images of circular and spherical targets and its impact to 3D object reconstruction  
*T. Luhmann*
- A contest of sensors in close range 3D imaging: performance evaluation with a new metric test object  
*M. Hess, A. Hosseininaveh Ahmadabadian and S. Robson*
- Photogrammetric determination of discrepancies between actual and planned position of dental implants  
*G. Forlani and F. Rivara*

### POSTERS (WG2, WG1, ICWG1/5b)

- Evaluation of mass market devices for the documentation of the Cultural Heritage - M. Piras, I. Aicardi and A. Lingua
- Impact assessment of the renewable energies in the Cultural Heritage: the case of the Way of St. James in Spain - P. Chias and T. Abad
- Terrestrial scanning or digital images in inventory of monumental objects - case study - J.S. Markiewicz and D. Zawieska
- Cultural Heritage: an example of graphical documentation with automated photogrammetric systems - M.G. Giuliano
- A new GIS-based map of villa Adriana, a multimedia guide for ancient paths - M.S. Saccone, M. Canciani, E. Pallottino, M. Michelini, A. Scortecci and F. Chiappetta
- A multi-range approach for Cultural Heritage survey: a case study in Mantua Unesco site - L. Fregonese, L. Taffurelli, F. Fassi, S. Chiarini and S. Cremonesi
- Point cloud-based survey for cultural heritage. An experience of integrated use of range-based and image-based technology for the San Francesco convent in Monterubbiano - A. Meschini, A. Dall'Asta, G. Leoni, E. Petrucci, D. Rossi, F. Sicuranza and A. Zona
- Application of SFM and laser scanning technology to the description of mosaics piece by piece - O. Ajioka and Y. Hori
- Web-based Visualization and Query of semantically segmented multiresolution 3D Models in the Field of Cultural Heritage - M. Auer, G. Agugiaro, N. Billen, L. Loos, A. Zipf
- Inheriting texture maps between different complexity 3D meshes - S. Simeonidis, A. Koutsoudis, G. Ioannakis and C. Chamzas
- New knowledge in determining the astronomical orientation of Incas object in Ollantaytambo, Peru - K. Hanzalová, J. Klokočník and J. Kostelecký
- Modelling the appearance of heritage metallic surfaces - L. MacDonald, J. Hindmarch and S. Robson
- Jeddah Historical Building Information Modelling "JHBIM"- Object Library - A. Baik, A. Alitany, J. Boehm and S. Robson
- Systems based on photogrammetry and image processing to evaluation of built heritage: tentative guidelines and control parameters - J. Valença
- Photogrammetric analysis of a heritage ceiling - L. MacDonald, A. Hosseininaveh Ahmadabadian and S. Robson
- A comparative study between metric and non-metric images for buildings 3D modelling - V. E. Oniga
- Sensitive analysis of observation model for human tracking using a stochastic process - W. Nakanishi and T. Fuse
- Comparisons of algorithms for the estimation of stereo-camera measurement precision - M. Shortis and J. Seager
- Congruence analysis of point clouds from unstable stereo image sequences - C. Jepping, F. Bethmann and T. Luhmann
- Quasi-five point algorithm with non-linear minimization - K. Oda
- A quality evaluation of single and multiple camera calibration approaches for an indoor multi camera tracking system - M. Adduci and K. Amlianitis
- Deformation monitoring with off-the-shelf digital cameras for civil engineering fatigue testing - I. Detchev, A. Habib, F. He and M. El-Badry
- Evaluating the geometric shape of a flying paraglider - K. Hanke and S. Schenk
- Robust global motion estimation with matrix completion - F. Arrigoni, B. Rossi, F. Malapelle, P. Fragneto and A. Fusiello
- Method for measuring lens distortion by using pinhole lens - J. Reznicek
- Radiometric calibration of dual sensor camera system: a comparison of classical and low cost calibration - M. Misgaiski-Hass and J. Hieronymus
- Photogrammetric deformation monitoring of the second Bosphorus bridge in Istanbul - Ö. Avsar, D. Akca and O. Altan
- 3D case studies of monitoring dynamic structural tests using long exposure Imagery - D.M.J. McCarthy, J.H. Chandler and A. Palmeri
- UAV platforms for Cultural Heritage survey: first results - M. Lo Brutto, A. Garraffa and P. Meli
- Aerial photogrammetry procedure optimized for micro UAV - T. Anai, T. Sasaki, H. Otani, K. Osaragi and N. Kochi
- Photogrammetric Archaeological Survey with UAV - A. Mouget and G. Lucet
- Interactive trunk extraction from forest point cloud - T. Mizoguchi and Y. Kobayashi

## WEDNESDAY, June 25<sup>th</sup>

### 8:45-10:30 - PLENARY SESSION - Room 1000

- **KEYNOTE4:** On shape and its semantics in BIM - S. Havemann (TU Graz, Austria)
- **KEYNOTE5:** ICT at the service of Cultural Heritage - A. Georgopoulos (NTUA, Greece)
- Vision talk: Close-range imaging and research priorities in Europe - P. Patias (University of Thessaloniki, Greece)
- ISPRS 2016 – Lena Halounova (ISPRS Congress Director)

### COFFEE BREAK & POSTERS

### 11:15-13:00 PARALLEL SESSIONS

#### Room 1000

#### Joint TS WG3 & WG5 – Forestry

Chairman: T. Dewez

- A feasibility study on the measurement of tree trunks in forests using multi-scale vertical images  
*A. Berveglieri, R. O. Oliveira and A. M.G. Tommaselli*
- A voxel-based technique to estimate the volume of trees from terrestrial laser scanner data  
*A. Bienert, C. Hess, H.-G. Maas and G. v. Oheimb*
- Detection of harvested trees in forests from repeated high density airborne laser scanning  
*P.J. Pietrzyk and R.C. Lindenbergh*
- Automatic reconstruction of skeletal structures from TLS forest scenes  
*A. Schilling and H.-G. Maas*

#### Room 300

#### TS WG2 - 3D modeling and Cultural Heritage

Chairman: P. Bryan

- Reassembling 3D thin fragments of unknown geometry in Cultural Heritage  
*S.Y. Zheng, R.Y. Huang, J. Li and Z. Wang*
- A novel high accuracy 3D scanning device for rock-art sites  
*T. Höll, G. Holler and A. Pinz*
- 3D modelling of trompe l'oeil decorated vaults using dense matching techniques  
*F. Chiabrando A. Lingua, F. Noardo and A. Spano'*
- 3D models mapping optimization through an integrated parameterization approach: cases studies from Ravenna  
*L. Cipriani, F. Fantini and S. Bertacchi*
- Visibility analysis of point cloud in close range photogrammetry  
*B. Alsadik, M. Gerke and G. Vosselman*

### LUNCH BREAK & POSTERS

### 14:45-16:15 PARALLEL SESSIONS

#### Room 1000

#### Joint TS WG1 & WG4 - Image matching and point clouds

Chairman: S. Robson

- A comparison of semiglobal & local dense matching algorithms for surface reconstruction  
*E. Dall'Asta and R. Roncella*
- Filtering of point clouds from photogrammetric surface reconstruction  
*K. Wenzel, M. Rothermel, N. Haala and D. Fritsch*
- On the evaluation of photogrammetric methods for dense 3D surface reconstruction in a metrological context  
*I. Toschi, A. Capra, L. De Luca, J.-A. Beraldin and L. Cournoyer*
- Object-based Multi-Image Semi-Global Matching - Concept and first results  
*F. Bethmann and T. Luhmann*

#### Room 300

#### TS WG4 - Automation in 3D modeling & VR

Chairman: J. Boehm

- Image pre-processing for optimizing SFM performances  
*G. Guidi, S. Gonizzi and L.L. Micoli*
- Evaluation of feature-based methods for automated network orientation  
*F. Apollonio, A. Ballabeni, M. Gaiani and F. Remondino*
- A line-based planar structure detection with precise boundary from the point cloud with uneven distribution density  
*R. Miyazaki, M. Yamamoto, E. Hanamoto, H. Izumi and K. Harada*
- Virtual Reality: developing a VR space for academic activities  
*D. Kaimaris, E. Stylianidis and N. Karanikolas*

### 16:15 PLENARY SESSION – Room 1000

- Closing remarks
- Awards

## POSTERS (WG3, WG4, ICWG1/5a)

- Surveying and mapping a cave using 3d laser scanner: the open challenge with free and open source software - T. Cosso, I. Ferrando and A. Orlando
- Augmented reality system using lidar point cloud data for displaying dimensional information of objects on mobile phones - S. Gupta and B. Lohani
- LiDAR application for the study of taxiway surface evenness and slope - M. Barbarella, M.R. De Blasiis, M. Fiani and M. Santoni
- Finding the next-best scanner position for as-built modeling of piping systems - K. Kawashima, S. Kanai and H. Date
- A non-conventional procedure for the 3D modeling of WWI forts - E. Nocerino, F. Fiorillo, S. Minto, F. Menna and F. Remondino
- Scaling up close-range surveys, a challenge for the generalization of as-built data in industrial applications - J.-F. Hullo and G. Thibault
- Scan registration using planar features - M. Previtali, M. Scaioni, L. Barazzetti and R. Brumana
- Door recognition in cluttered building interiors using imagery and LIDAR data - L. Díaz-Vilariño, J. Martínez-Sánchez, S. Lagüela, J. Armesto and K. Khoshelham
- Automatic Classification of coarse density LiDAR data in urban area - H. Mohammed Badawy, A. Moussa and N. El-Sheimy
- Automatic drawing for traffic marking by using local intensity changing points of mms lidar data - G. Takahashi, H. Takeda and Y. Shimano
- Automated Extraction of 3D Trees from Mobile LiDAR Point Clouds - Y. Yu, J. Li, H. Guan, D. Zai and C. Wang
- Smartphones Based Mobile Mapping Systems - A. Al-Hamad and N. El-Sheimy
- A sensor skid for precise 3D modeling of production lines - Nuechter, J. Elseberg, D. Borrmann, J. Schauer, D. Koriath and U. Rautenberg
- Geometric modelling of octagonal lamp poles - T. O. Chan and D. D. Lichti
- Three-dimensional imaging of hold baggage for airport security - S. Kolokytha, R. Speller and S. Robson
- Pile volume measurement by range imaging camera in indoor environment - C. Altuntas
- Processing lidar waveform data for 3d visual assessment of forest environments - F. Pirotti, E. Lingua, A. Guarnieri, A. Masiero and A. Vettore
- A real-time photogrammetry system based on embedded architecture - S.Y. Zheng, L. Gui, X.N. Wang and D. Ma
- Potentials of small, lightweight and low cost multi-echo laser scanners for detecting grape berries - A. Djuricic, M. Weinmann and B. Jutzi
- Robust surface matching by integrating edge segments - N. Kochi, T. Sasaki, K. Kitamura and S. Kaneko
- Lossless data compression of grid-based digital elevation models: a png image format evaluation - G. Scarmana