



Towards Photogrammetry 2020

ISPRS Technical Commission II
Symposium 2018



Riva del Garda, Italy

3-7 June 2018



MONDAY, 4th JUNE

Oral Presentations

4/6 10:00am - 12:30pm **PLENARY - Opening, Keynote and Companies and Scientific Initiatives**
Session Chair: Fabio Remondino **Room: Garda A**

- Keynote speaker: **Davide Scaramuzza** (University of Zurich, Switzerland):
 AUTONOMOUS, AGILE, VISION-CONTROLLED DRONES: FROM ACTIVE TO EVENT VISION

- Companies presentations:
 FROM EXPERT TO EVERYONE: DEMOCRATIZING PHOTOGRAMMETRY
 Christoph Strecha, Pix4D

GEOCLOUD.WORK - YOUR CLOUD-BASED GEOSPATIAL OFFICE
 Yuri Raizman, GeoCloud

- Scientific & Capacity Building initiatives:
 CAMERA CALIBRATION AND PERFORMANCE DATABASE
 Mark Shortis, Department of Geospatial Science, RMIT University, Australia

Lunch Break

Room: Palavela

Poster Session

4/6 2:30pm - 4:00pm **TS WG II/1 - Image Orientation**
Session Chair: Erica Nocerino **Room: Garda A**

ROBUST AND ACCURATE IMAGE-BASED GEOREFERENCING EXPLOITING RELATIVE ORIENTATION CONSTRAINTS
 S. Cavegn, S. Blaser, S. Nebiker, N. Haala

SEAMLESS IMAGE MOSAICKING VIA SYNCHRONIZATION
 E. Santellani, E. Maset, A. Fusiello

A GUIDED REGISTRATION STRATEGY EMPLOYING VIRTUAL PLANES TO OVERCOME NON-STANDARD GEOMETRIES – USING THE EXAMPLE OF MOBILE MAPPING AND AERIAL OBLIQUE IMAGERY
 P. Jende, F. Nex, M. Gerke, G. Vosselman

USE OF FISHEYE PARROT BEBOP 2 IMAGES FOR 3D MODELLING USING COMMERCIAL PHOTOGRAMMETRIC SOFTWARE
 D. Pagliari, L. Pinto

4/6 2:30pm - 4:00pm **TS WG II/4 - 3D Scene Reconstruction and Analysis**
Session Chair: Franz Rottensteiner **Room: Garda B**

IFC WALL RECONSTRUCTION FROM UNSTRUCTURED POINT CLOUDS
 M. Bassier, R. Klein, B. Van Genechten, M. Vergauwen

SEMANTIC BUILDING FAÇADE SEGMENTATION FROM AIRBORNE OBLIQUE IMAGES

Y. Lin, F. Nex, M. Y. Yang

SENSOR-TOPOLOGY BASED SIMPLICIAL COMPLEX RECONSTRUCTION FROM MOBILE LASER SCANNING

S. Guinard, B. Vallet

LARGE SCALE TEXTURED MESH RECONSTRUCTION FROM MOBILE MAPPING IMAGES AND LIDAR SCANS

M. Boussaha, B. Vallet, P. Rives

4/6 2:30pm
-
4:00pm

TS WG II/10 -3D Mapping for Environmental & Infrastructure Monitoring

Session Chair: Martin Rutzinger

Room: Dolomiti

SENSOR- AND SCENE-GUIDED INTEGRATION OF TLS AND PHOTOGRAMMETRIC POINT CLOUDS FOR LANDSLIDE MONITORING

T. Zieher, I. Toschi, F. Remondino, M. Rutzinger, C. Kofler, A. Mejia Aguilar, R. Schlögel

DETERMINING GEOMETRIC PARAMETERS OF AGRICULTURAL TREES FROM LASER SCANNING DATA OBTAINED WITH UNMANNED AERIAL VEHICLE

E. Hadas, G. Józków, A. Walicka, A. Borkowski

AUTOMATED CALIBRATION OF FEM MODELS USING LIDAR POINT CLOUDS

B. Riveiro, G. Cubreiro, B. Conde, M. Cabaleiro, R. Lindenbergh, M. Soilán, J. C. Caamaño

ANALYSIS OF LOW-LIGHT AND NIGHT-TIME STEREO-PAIR IMAGES FOR PHOTOGRAMMETRIC RECONSTRUCTION

M. Santise, M. Partesano, K. Thoeni, R. Roncella, A. Giacomini, F. Diotri

Coffee Break

4/6 4:30pm
-
6:00pm

TS WG II/8 - Data Acquisition and Processing in Cultural Heritage

Session Chair: Diego Gonzalez-Aguilera

Room: Garda A

DEEP LEARNING FOR LOW TEXTURED IMAGE MATCHING

V. V. Kniaz, V. V. Fedorenko

DIACHRONIC RECONSTRUCTION OF LOST CULTURAL HERITAGE SITES. STUDY CASE OF THE MEDIEVAL WALL OF AVILA (SPAIN)

P. Rodríguez-González, S. Cardozo Mamani, A. Guerra Campo, L. J. Sanchez-Aparicio, S. Del Pozo, A. L. Muñoz-Nieto, D. Gonzalez-Aguilera

OPTO-TECHNICAL MONITORING - A STANDARDIZED METHODOLOGY TO ASSESS THE TREATMENT OF HISTORICAL STONE SURFACES

M. Rahrig, R. Drewello, A. Lazzeri

COMPARISON AND ASSESSMENT OF 3D REGISTRATION AND GEOREFERENCING APPROACHES OF POINT CLOUDS IN THE CASE OF EXTERIOR AND INTERIOR HERITAGE BUILDING RECORDING

A. Murtiyoso, P. Grussenmeyer

4/6	4:30pm	TS ICWG I/II - UAS & Small Multi-sensor Platforms: Concepts & Applications	
	-	Session Chair: Francesco Nex	Room: Garda B
	6:00pm		
		VEGETATION REMOVAL FROM UAV ACQUIRED ORTHOPHOTOS, USING COMBINATION OF RGB AND NIF IMAGERY D. Skarlatos, M. Vlachos	
		LOCALIZATION AND MAPPING USING A NON-CENTRAL CATADIOPTIC CAMERA SYSTEM M. Khurana, C. Armenakis	
		ON A FUNDAMENTAL EVALUATION OF A UAV EQUIPPED WITH A MULTI-CHANNEL LASER SCANNER K. Nakano, H. Suzuki, K. Omori, K. Hayakawa, M. Kurodai	
		ACQUISITION OF GEOMETRICAL DATA OF SMALL RIVERS WITH AN UNMANNED WATER VEHICLE H. Sardemann, A. Eltner, H.-G. Maas	

4/6	4:30pm	TS WG II/9 - Underwater Data Acquisition and Processing	
	-	Session Chair: Fabio Menna	Room: Dolomiti
	6:00pm		
		STRUCTURED-LIGHT BASED 3D LASER SCANNING OF SEMI-SUBMERGED STRUCTURES J. van der Lucht, M. Bleier, F. Leutert, K. Schiling, A. Nüchter	
		SUBAQUATIC DIGITAL ELEVATION MODEL FROM UAV-IMAGERY C. Mulsow, R. Kenner, Y. Bühler, A. Stoffel, H.-G. Maas	
		A CASE STUDY ON THROUGH-WATER DENSE IMAGE MATCHING G. Mandlbürger	
		MONITORING CORAL GROWTH - THE DICHOTOMY BETWEEN UNDERWATER PHOTOGRAMMETRY AND GEODETIC CONTROL NETWORK F. M. Neyer, E. Nocerino, A. W. Grün	

Poster Session

Room: Palavela

4/6	1:30pm	INTEGRATION OF THREE-DIMENSIONAL DIGITAL MODELS AND 3D GIS: THE DOCUMENTATION OF THE MEDIEVAL BURIALS OF AMITERNUM (L'AQUILA, ITALY)	
	-		
	2:30pm	I. Trizio, F. Savini, A. Giannangeli	
		FROM 2D TO 3D SUPERVISED SEGMENTATION AND CLASSIFICATION FOR CULTURAL HERITAGE APPLICATIONS E. Grilli, D. Dinunno, G. Petrucci, F. Remondino	
		THE WINCKELMANN300 PROJECT: DISSEMINATION OF CULTURE WITH VIRTUAL REALITY AT THE CAPITOLINE MUSEUM IN ROME S. Gonizzi Barsanti, S. G. Malatesta, F. Lella, B. Fanini, F. Sala, E. Dodero, L. Petacco	
		OPEN SOURCE HBIM FOR CULTURAL HERITAGE: A PROJECT PROPOSAL F. Diara, F. Rinaudo	

3D MODELLING OF A HISTORICAL BUILDING USING CLOSE-RANGE PHOTOGRAMMETRY AND REMOTELY PILOTED AIRCRAFT SYSTEMS (RPAS)

M. Lo Brutto, D. Ebolese, G. Dardanelli

HABANAPP: HAVANA'S ARCHITECTURAL HERITAGE A CLICK AWAY

C. Morganti, C. Bartolomei

3D CULTURAL HERITAGE DOCUMENTATION: A COMPARISON BETWEEN DIFFERENT PHOTOGRAMMETRIC SOFTWARE AND THEIR PRODUCTS

S. Gagliolo, E. Ausonio, B. Federici, I. Ferrando, D. Passoni, D. Sguerso

PRELIMINARY EVALUATION OF A COMMERCIAL 360 MULTI-CAMERA RIG FOR PHOTOGRAMMETRIC PURPOSES

L. Teppati Losè, F. Chiabrando, A. Spanò

GEOMATIC ARCHAEOLOGICAL RECONSTRUCTION AND A HYBRID VIEWER FOR THE ARCHAEOLOGICAL SITE OF CÁPARRA (SPAIN)

C. Tejeda-Sanchez, A. L. Muñoz-Nieto, P. Rodríguez-González

MULTISPECTRAL AND PANCHROMATIC REGISTRATION OF ALSAT-2 IMAGES USING DENSE VECTOR MATCHING FOR PAN-SHARPENING PROCESS

I. Boukerch, N. Farhi, M. S. Karoui, K. Djerriri, R. Mahmoudi

EXPLOITING AUTO-COLLIMATION FOR REAL-TIME ONBOARD MONITORING OF SPACE OPTICAL CAMERA GEOMETRIC PARAMETERS

W. Liu, H. Wang, D. Liu, Y. Miu

INDOOR PHOTOGRAMMETRY AIDED WITH UWB NAVIGATION

A. Masiero, F. Fissore, A. Guarnieri, A. Vettore

AUTOMATED MOSAICKING OF GEOSTATIONARY OCEAN COLOR IMAGER BY COMBINATION OF SPATIAL AND FREQUENCY MATCHING

H.-G. Kim, J.-H. Son, T. Kim

INVESTIGATIONS ON THE BUNDLE ADJUSTMENT RESULTS FROM SFM-BASED SOFTWARE FOR MAPPING PURPOSES

Y. A. Lumban-Gaol, A. Murtiyoso, B. H. Nugroho

COMPARISON BETWEEN RGB AND RGB-D CAMERAS FOR SUPPORTING LOW-COST GNSS URBAN NAVIGATION

L. Rossi, C. I. De Gaetani, D. Pagliari, E. Realini, M. Reguzzoni, L. Pinto

COMBINING INDEPENDENT VISUALIZATION AND TRACKING SYSTEMS FOR AUGMENTED REALITY

P. Hübner, M. Weinmann, M. Hillemann, B. Jutzi, S. Wursthorn

VALIDATING A WORKFLOW FOR TREE INVENTORY UPDATING WITH 3D POINT CLOUDS OBTAINED BY MOBILE LASER SCANNER

J. Wang, R. Lindenbergh

LEARNED COMPACT LOCAL FEATURE DESCRIPTOR FOR TLS-BASED GEODETIC MONITORING OF NATURAL OUTDOOR SCENES

Z. Gojcic, C. Zhou, A. Wieser

MESH MODELLING OF 3D POINT CLOUD FROM UAV IMAGES BY POINT CLASSIFICATION AND GEOMETRIC CONSTRAINTS

S. Kim, H.-g. Kim, T. Kim

AUTOMATIC RAIL EXTRACTION AND CLEARANCE CHECK WITH A POINT CLOUD CAPTURED BY MLS IN A RAILWAY

Y. Niina, R. Honma, Y. Honma, K. Kondo, K. Tsuji, T. Hiramatsu, E. Oketani

MULTIPLE TLS POINT CLOUD REGISTRATION BASED ON POINT PROJECTION IMAGES

T. Sumi, H. Date, S. Kanai

INDOOR & OUTDOOR MOBILE MAPPING SYSTEMS FOR ARCHITECTURAL SURVEYS

M. Campi, A. di Luggo, S. Monaco, M. Siconolfi, D. Palomba

CLASSIFICATION OF DUAL-WAVELENGTH AIRBORNE LASER SCANNING POINT CLOUD BASED ON THE RADIOMETRIC PROPERTIES OF THE OBJECTS

M. Pilarska

DEM BASED REGISTRATION OF MULTI-SENSOR AIRBORNE POINT CLOUDS EXEMPLARY SHOWN ON A RIVER SIDE IN NON URBAN AREA

R. Boerner, Y. Xu, L. Hoegner, R. Baran, F. Steinbacher, U. Stilla

RECONSTRUCTION OF 3D MODELS FROM POINT CLOUDS WITH HYBRID REPRESENTATION

P. Hu, B. Yang, Z. Dong, P. Yuan, F. Liang

REPRESENTING ROAD RELATED LASERSCANNED DATA IN CURVED REGULAR GRID: A SUPPORT TO AUTONOMOUS VEHICLES

V. Poto, A. Csepinszky, A. Barsi

THE ARCHAEOLOGICAL SITE OF NORA (SARDINIA, ITALY) - 3D DOCUMENTATION AND WEB VISUALIZATION WITH VERY HIGH RESOLUTION PHOTOGRAMMETRIC POINT CLOUDS AND 3D GIS

F. Carraro, J. Bonetto, D. Morabito, F. Remondino

Welcome Party

4/6 6:00 pm

Italian Garden - Lake view, Congress Centre

TUESDAY, 5th JUNE

Oral Presentations

- 5/6** 9:00am **PLENARY - Keynote, Companies and Scientific Initiatives**
 - Session Chair: **Isabella Toschi** **Room: Garda A**
 10:30am
- Keynote speaker: **Jantien Stoter** (Delft University of Technology, The Netherlands):
 “TOWARDS A FLAWLESS 3D/4D CITY MODELLING INFORMATION CHAIN:
 WHERE DO 3D/4D DATA REQUIREMENTS AND 3D/4D DATA COLLEC-
 TION POSSIBILITIES MEET?”
 - Companies presentations:
**PHOTOGRAMMETRY & COMPUTER VISION FOR LARGE SCALE SURFACE RE-
 CONSTRUCTION**
 Konrad Wenzel, nFrames
 - LEICA REALCITY: NEXT GENERATION URBAN REALITY CAPTURE**
 Felix Rohrbach, Leica
 - Scientific & Capacity Building initiatives:
**ISPRS BENCHMARK CHALLENGE ON LARGE SCALE CLASSIFICATION OF
 VHR GEOSPATIAL DATA**
 Ribana Roscher, University of Bonn, Germany
 - SPREADING OUT THE KNOWLEDGE FROM ISPRS EDUCATIONAL EVENTS
 USING A DISSEMINATION INTERNET PLATFORM**
 Marco Scaioni, Politecnico di Milano, Italy

Coffee Break

- 5/6** 11:00am **TS WG II/7 - Vision Metrology**
 - Session Chair: **Hans-Gerd Maas** **Room: Garda A**
 12:30pm
- PHOTOGRAMMETRY FOR INDUSTRY 4.0 – PROSPECTS AND CHALLENGES**
 T. Luhmann (Invited Talk)
 - BUNDLE ADJUSTMENT-BASED STABILITY ANALYSIS METHOD WITH A
 CASE STUDY OF A DUAL FLUOROSCOPY IMAGING SYSTEM**
 K. Al-Durgham, D. Lichti, I. Detchev, G. Kuntze, J. Ronsky
 - DIGITAL IMAGE CORRELATION FROM COMMERCIAL TO FOS SOFT-
 WARE: A MATURE TECHNIQUE FOR FULL-FIELD DISPLACEMENT MEA-
 SUREMENTS**
 V. Belloni, R. Ravanelli, A. Nascetti, M. Di Rita, D. Mattei, M. Crespi
 - PROTOTYPIC DEVELOPMENT AND EVALUATION OF A MEDIUM FOR-
 MAT METRIC CAMERA**
 H. Hastedt, R. Rofallski, T. Luhmann, R. Rosenbauer, D. Ochsner, D. Rieke-Zapp

5/6 11:00am **Joint Technical Session ARIDA - WG II/4 - 3D Scene Reconstruction and Analysis**

- **Session Chair: Takashi Fuse** **Room: Garda B**

12:30pm

LANDSCAPE EVALUATION METHOD BY USING DEPTH INFORMATION

Yoichi Kunii (Tokyo University of Agriculture, Japan)

CASE STUDIES OF CLOUD SERVICES FOR 3D MODELING AND PRECISION AGRICULTURE

Ryuta Wakutsu (Kokusai Kogyo, Japan)

CAMERA CALIBRATION CONSIDERATIONS FOR UAV PHOTOGRAMMETRY

Clive Fraser (Univ. of Melbourne, Australia)

PROCESSING OF AERIAL OBLIQUE DATASETS - WHERE DO WE STAND?

Isabella Toschi (Bruno Kessler Foundation, Italy)

5/6 11:00am **TS WG II/9 - Underwater Data Acquisition and Processing**

- **Session Chair: Dimitrios Skarlatos** **Room: Dolomiti**

12:30pm

QUASI-ORTHORECTIFIED PROJECTION FOR THE MEASUREMENT OF RED GORGONIAN COLONIES

G. Pavoni, M. Palma, M. Callieri, M. Dellepiane, C. Cerrano, U. Pantaleo, R. Scopigno

IMPROVING UNDERWATER ACCURACY BY EMPIRICAL WEIGHTING OF IMAGE OBSERVATIONS

F. Menna, E. Nocerino, P. Drap, F. Remondino, A. Murtiyoso, P. Grussenmeyer, N. Börlin

NUMERICAL SIMULATION AND EXPERIMENTAL VALIDATION OF WAVE PATTERN INDUCED COORDINATE ERRORS IN AIRBORNE LIDAR BATHYMETRY

K. Richter, D. Mader, P. Westfeld, H.-G. Maas

UNDERWATER PHOTOGRAMMETRY IN VERY SHALLOW WATERS: CAUSTICS EFFECT REMOVAL AND MAIN CHALLENGES

P. Agrafiotis, D. Skarlatos, T. Forbes, C. Poullis, M. Skamantzari, A. Georgopoulos

5/6 11:00am **TS Youth Forum**

- **Session Chair: Christian Heipke** **Room: Belvedere**

12:30pm

EVALUATION OF A TRAFFIC SIGN DETECTOR BY SYNTHETIC IMAGE DATA FOR ADVANCED DRIVER ASSISTANCE SYSTEMS

A. Hanel, D. Kreuzpaintner, U. Stilla

3D BUILDING CHANGE DETECTION BETWEEN CURRENT VHR IMAGES AND PAST LIDAR DATA

K. Zhou, B. Gorte, R. Lindenbergh, E. Widyaningrum

POLE-LIKE ROAD FURNITURE DETECTION IN SPARSE AND UNEVENLY DISTRIBUTED MOBILE LASER SCANNING DATA

F. Li, M. Lehtomäki, S. Oude Elberink, G. Vosselman, E. Puttonen, A. Kukko, J. Hyypä

A METADATA BASED APPROACH FOR ANALYZING UAV DATASETS FOR PHOTOGRAMMETRIC APPLICATIONS

A. Dhanda, F. Remondino, M. Santana Quintero

MULTI-TEMPORAL CHANGE DETECTION USING UAV IMAGES

S. Makuti, F. Nex, M. Y. Yang

Lunch Break

Poster Session

5/6 2:30pm
-
4:00pm

Joint Technical Session EuroSDR / VOLTA - 3D mapping

Session Chair: Jon Mills

Room: Garda A

POINT CLOUDS AND DERIVATIVES FOR NATIONWIDE GEOSPATIAL INFORMATION

G. Vosselman (Invited Talk)

EXTRACTION OF BUILDING ROOF EDGES FROM LIDAR DATA TO OPTIMIZE THE DIGITAL SURFACE MODEL FOR TRUE ORTHOPHOTO GENERATION

E. Widyaningrum, R. Lindenbergh, B. Gorte, K. Zhou

INTERACTIVE BOUNDARY DELINEATION FROM UAV DATA

S. Crommelinck, B. Höfle, M. Koeva, M. Y. Yang, G. Vosselman

EVALUATION OF DEEP LEARNING BASED STEREO MATCHING METHODS: FROM GROUND TO AERIAL IMAGES

J. Liu, S. Ji, C. Zhang, Z. Qin

5/6 2:30pm
-
4:00pm

TS WG II/5 - Dynamic Scene Analysis

Session Chair: Yury Vizilter

Room: Garda B

AUTOMATIC SPATIO-TEMPORAL FLOW VELOCITY MEASUREMENT IN SMALL RIVERS USING THERMAL IMAGE SEQUENCES

D. Lin, A. Eltner, H. Sardemann, H.-G. Maas

HIGH SPEED VIDEOMETRIC MONITORING OF ROCK BREAKAGE

J. Allemand, M. Shortis, M. Elmouttie

RECOVERING THE 3D POSE AND SHAPE OF VEHICLES FROM STEREO IMAGES

M. Coenen, F. Rottensteiner, C. Heipke

SUB-PIXEL ACCURACY CRACK WIDTH DETERMINATION ON CONCRETE BEAMS IN LOAD TESTS BY TRIANGLE MESH GEOMETRY ANALYSIS

F. Liebold, H.-G. Maas

5/6 2:30pm
-
4:00pm

TS WG II/8 - Data Acquisition and Processing in Cultural Heritage

Session Chair: Fulvio Rinaudo

Room: Dolomiti

OPEN SOURCE CLOUD-BASED TECHNOLOGIES FOR BIM

S. Logothetis, E. Karachaliou, E. Valari, E. Stylianidis

GIS-HBIM INTEGRATION FOR THE MANAGEMENT OF HISTORICAL BUILDINGS

G. Vacca, E. Quaquero, D. Pili, M. Brandolini

BUILDING INFORMATION MODELS FOR MONITORING AND SIMULATION DATA IN HERITAGE BUILDINGS

D. P. Pocobelli, J. Boehm, P. Bryan, J. Still, J. Grau-Bové

MESH-TO-BIM: FROM SEGMENTED MESH ELEMENTS TO BIM MODEL WITH LIMITED PARAMETERS

X. Yang, M. Koehl, P. Grussenmeyer

Coffee Break

5/6 4:30pm - 6:00pm TS WG II/1 - Image Orientation

Session Chair: **Andrea Fusiello**

Room: **Garda A**

MODULAR BUNDLE ADJUSTMENT FOR PHOTOGRAMMERIC COMPUTATIONS

N. Börlin, A. Murtiyoso, P. Grussenmeyer, F. Menna, E. Nocerino

ROBUST IMAGE ORIENTATION BASED ON RELATIVE ROTATIONS AND TIE POINTS

X. Wang, F. Rottensteiner, C. Heipke

EXPERIENCES WITH ACQUIRING HIGHLY REDUNDANT SPATIAL DATA TO SUPPORT DRIVERLESS VEHICLE TECHNOLOGIES

Z. Koppányi, C. K. Toth

POSITION ACCURACY ANALYSIS OF A ROBUST VISION-BASED NAVIGATION SYSTEM

S. Gaglione, S. Del Pizzo, S. Troisi, A. Angrisano

5/6 4:30pm - 6:00pm TS ICWG II/III - Pattern Analysis in Remote Sensing

Session Chair: **Uwe Stilla**

Room: **Garda B**

LAKE ICE DETECTION IN LOW-RESOLUTION OPTICAL SATELLITE IMAGES

M. Tom, U. Kaelin, M. Suetterlin, E. Baltsavias, K. Schindler

HIGH QUALITY FACADE SEGMENTATION BASED ON STRUCTURED RANDOM FOREST, REGION PROPOSAL NETWORK AND RECTANGULAR FITTING

K. Rahmani, H. Mayer

VARIABILITY OF REMOTE SENSING SPECTRAL INDICES IN BOREAL LAKE BASINS

T. V. Hakala, I. Pölönen, E. Honkavaara, R. Näsi, T. Hakala, A. Lindfors

A COMPARISON OF TWO STRATEGIES FOR AVOIDING NEGATIVE TRANSFER IN DOMAIN ADAPTATION BASED ON LOGISTIC REGRESSION

A. Paul, F. Rottensteiner, C. Heipke

5/6 4:30pm - 6:00pm TS WG II/3 - Point Cloud Processing

Session Chair: **Jan Boehm**

Room: **Dolomiti**

PLANE-BASED REGISTRATION OF SEVERAL THOUSAND LASER SCANS ON STANDARD HARDWARE

D. Wujanz, S. Schaller, F. Gielsdorf, L. Gründig

CLASSIFICATION OF MOBILE LASER SCANNING POINT CLOUDS OF URBAN SCENES EXPLOITING CYLINDRICAL NEIGHBOURHOODS

M. Zheng, M. Lemmens, P. van Oosterom

CLASSIFICATION OF MLS POINT CLOUDS IN URBAN SCENES USING DETRENDED GEOMETRIC FEATURES FROM SUPERVOXEL-BASED LOCAL CONTEXT

Z. Sun, Y. Xu, L. Hoegner, U. Stilla

APPLICATION OF MLS DATA TO THE ASSESSMENT OF SAFETY-RELATED FEATURES IN THE SURROUNDING AREA OF AUTOMATICALLY DETECTED PEDESTRIAN CROSSINGS

M. Soilán, B. Riveiro, A. Sánchez-Rodríguez, L. M. González-de Santos

Poster Session

Room: Palavela

5/6

1:30pm PHOTOGRAMMETRY FOR ARCHAEOLOGY: COLLECTING PIECES TOGETHER

- A. Chibunichev, V. Knyaz, D. Zhuravlev

2:30pm

ANCIENT SHIPYARD ON TURKEY'S DANA ISLAND: ITS 3D MODELLING AND DOCUMENTATION WITH PHOTOGRAMMETRY AND COMPUTER GRAPHICS

A. Denker, H. Oniz

INTEGRATED SURVEY PROCEDURES FOR THE VIRTUAL READING AND FRUITION OF HISTORICAL BUILDINGS

S. Scandurra, M. Pulcrano, V. Cirillo, M. Campi, A. di Luggo, O. Zerlenga

CULTURAL HERITAGE RECONSTRUCTION FROM HISTORICAL PHOTOGRAPHS & VIDEOS

F. Condorelli, F. Rinaudo

RESEARCH ON HISTORIC BIM OF BUILT HERITAGE IN TAIWAN -A CASE STUDY OF HUANGXI ACADEMY

Y.-C. Lu, T.-Y. Shih, Y.-N. Yen

DIGITAL PHOTOGRAMMETRY FOR THE GEOMETRICAL ANALYSIS OF THE UMBRELLA-SHAPED DOME OF BAIA (NAPLES)

L. Aliberti, M. Á. Alonso-Rodríguez

THE MULTITEMPORAL PHOTOGRAMMETRIC DATA IN ARCHAEOLOGICAL AND ARCHITECTURAL RESEARCH IN THE ROYAL CASTLE IN WARSAW - FIRST RESULTS

J. Markiewicz, D. Zawieska, A. Bocheńska, A. Tobiasz, S. Łapiński

3D VIRTUAL CH INTERACTIVE INFORMATION SYSTEMS FOR A SMART WEB BROWSING EXPERIENCE FOR DESKTOP PCS AND MOBILE DEVICE.

A. Scianna, M. La Guardia

RESPONSIVE URBAN MODELS BY PROCESSING SETS OF HETEROGENEOUS DATA

M. Calvano, A. Casale, E. Ippoliti, F. Guadagnoli

"TORINO 1911" PROJECT: A CONTRIBUTION OF A SLAM-BASED SURVEY TO EXTENSIVE 3D HERITAGE MODELING

F. Chiabrando, C. Della Coletta, G. Sammartano, A. Spanò, A. Spreafico

3D COMPARISON TOWARDS A COMPREHENSIVE ANALYSIS OF A BUILDING IN CULTURAL HERITAGE

I. Selvaggi, M. Dellapasqua, F. Franci, A. Spangher, D. Visintini, G. Bitelli

WATCHING GRASS GROW – A PILOT STUDY ON THE SUITABILITY OF
PHOTOGRAMMETRIC TECHNIQUES FOR QUANTIFYING CHANGE IN
ABOVEGROUND BIOMASS IN GRASSLAND EXPERIMENTS

M. Kröhnert, R. Anderson, J. Bumberger, P. Dietrich, W. S. Harpole, H.-G. Maas

PANORAMIC IMAGES, 2D FEATURE-BASED AND CHANGE DETECTION
METHODS FOR THE DOCUMENTATION OF CONTAMINATED CRIME
SCENES

D. Abate, I. Toschi, C. Sturdy Colls, F. Remondino

OPEN PIT MINE 3D MAPPING BY TLS AND DIGITAL PHOTOGRAMMETRY:
3D MODEL UPDATE THANKS TO A SLAM BASED APPROACH

G. Vassena, A. Clerici

INDIVIDUAL ROCKS SEGMENTATION IN TERRESTRIAL LASER SCANNING
POINT CLOUD USING ITERATIVE DBSCAN ALGORITHM

A. Walicka, G. Józków, A. Borkowski

DTM GENERATION THROUGH UAV SURVEY WITH A FISHEYE CAMERA
ON A VINEYARD

G. Ronchetti, D. Pagliari, G. Sona

TRAINING IN INNOVATIVE TECHNOLOGIES FOR CLOSE-RANGE SENS-
ING IN ALPINE TERRAIN

M. Rutzinger, M. Bremer, B. Höfle, M. Hämmerle, R. Lindenbergh, S. Oude Elberink, F. Pirotti, M. Scaioni, D. Wujanz, T. Zieher

AUTOMATED SHAPE ANALYSIS OF TEETH FROM THE ARCHAEOLOGICAL
SITE OF NERQIN NAVER

A. Gaboutchian, H. Simonyan, V. Knyaz, G. Petrosyan, L. Ter-Vardanyan, N.A. Leybova, S.V. Apresyan

A VOXEL-BASED METADATA STRUCTURE FOR CHANGE DETECTION IN
POINT CLOUDS OF LARGE-SCALE URBAN AREAS

J. Gehrung, M. Hebel, M. Arens, U. Stilla

FEASIBILITY OF SMARTPHONE BASED PHOTOGRAMMETRIC POINT
CLOUDS FOR THE GENERATION OF ACCESSIBILITY MAPS

E. Angelats, M. E. Parés, P. Kumar

BUILDING CONSTRUCTION PROGRESS MONITORING USING UNMANNED
AERIAL SYSTEM (UAS), LOW-COST PHOTOGRAMMETRY, AND GEOGRAPH-
IC INFORMATION SYSTEM (GIS)

J. R. Bognot, C. G. Candido, A. C. Blanco, J. R. Y. Montelibano

SPACE-BORNE LASER ALTIMETER GEOLOCATION ERROR ANALYSIS

Y. Wang, J. Fang, Y. Ai

PHOTOGRAMMETRIC TECHNIQUES FOR PALEOANTHROPOLOGICAL
OBJECTS PRESERVING AND STUDYING

V. Knyaz, N. Leybova, R. Galeev, M. Novikov, A. Gaboutchian

CLASSIFICATION OF STRAWBERRY FRUIT SHAPE BY MACHINE LEARNING

T. Ishikawa, A. Hayashi, S. Nagamatsu, Y. Kyutoku, I. Dan, T. Wada, K. Oku, Y. Saeki, S. Uto, T. Tanabata, S. Isobe, N. Kochi

DEVELOPMENT OF A SINGLE-VIEW ODOMETER BASED ON PHOTO-
GRAMMETRIC BUNDLE ADJUSTMENT

S. Yoon, W. Yoon, J. Jung, T. Kim

LOW-COST 3D DEVICES AND LASER SCANNERS COMPARISON FOR THE
APPLICATION IN ORTHOPEDIC CENTRES

D. F. Redaelli, S. Gonizzi Bersanti, E. Biffi, P. Fraschini, G. Colombo

APPLICATIONS OF ACTION CAM SENSORS IN THE ARCHAEOLOGICAL
YARD

M. Pepe, S. Ackermann, L. Fregonese, F. Fassi, A. Adami

WEDNESDAY, 6th JUNE

Oral Presentations

- 6/6** 9:00am **PLENARY - Keynote and Companies**
 - Session Chair: **Fabio Remondino** **Room: Garda A**
 10:30am
- Keynote speaker: **Andre' Streilein** (Swisstopo, Switzerland):
 "NATIONAL MAPPING AGENCIES IN AGE OF DIGITAL TRANSFORMATION AND THE CHANGING DEMANDS FOR RESEARCH AND DEVELOPMENT"
 - Companies presentations:
 AERIAL PHOTOGRAMMETRY FOR 3D SURFACE MODELLING OF COMPLEX ENVIRONMENTS: THE EXPERIENCE @ AVT
 Klaus Legat, AVT
 - X-PAD OFFICE FUSION - THE GEOSPATIAL DATA OFFICE SOFTWARE, A NEW CONCEPT FOR PROCESSING ALL TYPES OF GEOSPATIAL DATA WITH REAL INTEGRATION OF DIFFERENT INFORMATION
 Diego Borsani, Keven Corazza, Geomax
 - TAKE YOUR DIGITAL SURFACE MODELS TO THE NEXT LEVEL WITH ENVI OPTICALSCAPE
 Andrea Marchesi, Harris

Coffee Break

- 6/6** 11:00am **TS WG II/8 - Data Acquisition and Processing in Cultural Heritage**
 - Session Chair: **Francesco Fassi** **Room: Garda A**
 12:30pm
- IMAGE-BASED 3D RECONSTRUCTION AND MODELING VIA WEB SERVICE
 Y. Tefera, F. Poiesi, D. Morabito, F. Remondino, E. Nocerino, P. Chippendale
 - SPECTRAL AND 3D CULTURAL HERITAGE DOCUMENTATION USING A MODIFIED CAMERA
 E. K. Webb, S. Robson, L. MacDonald, D. Garside
 - EVALUATION OF PHOTOGRAMMETRIC BLOCK ORIENTATION USING QUALITY DESCRIPTORS FROM STATISTICALLY FILTERED TIE POINTS
 A. Calantropio, M. P. Deseilligny, F. Rinaudo, E. Rupnik
 - MAPPING VIS AND UVL IMAGERY ON 3D GEOMETRY FOR NON-INVASIVE, NON-CONTACT ANALYSIS OF A VASE
 E. Nocerino, D. Rieke-Zapp, E. Trinkl, R. Rosenbauer, E. M. Farella, D. Morabito, F. Remondino
- 6/6** 11:00am **TS ICWG I/II - UAS & Small Multi-sensor Platforms: Concepts & Applications**
 - Session Chair: **Costas Armenakis** **Room: Garda B**
 12:30pm
- UAV-BASED DETECTION OF UNKNOWN RADIOACTIVE BIOMASS DEPOSITS IN CHERNOBYL'S EXCLUSION ZONE
 S. Briechele, A. Sizov, O. Tretyak, V. Antropov, N. Molitor, P. Krzystek

REAL-TIME AND POST-PROCESSED GEOREFERENCING FOR HYPER-SPECTRAL DRONE REMOTE SENSING

R. Alves Oliveira, E. Khoramshahi, J. Suomalainen, T. Hakala, N. Viljanen, E. Honkavaara

THE ESTIMATION OF PRECISIONS IN THE PLANNING OF UAS PHOTOGRAMMETRIC SURVEYS

D. Passoni, B. Federici, I. Ferrando, S. Gagliolo, D. Sguerso

CLOSE-RANGE MINI-UAVS PHOTOGRAMMETRY FOR ARCHITECTURE SURVEY

L. Carnevali, E. Ippoliti, F. Lanfranchi, S. Menconero, M. Russo, V. Russo

6/6

11:00am

-

12:30pm

TS WG II/10 - 3D Mapping for Environmental & Infrastructure Monitoring

Session Chair: **Roderik Lindenbergh**

Room: **Dolomiti**

AN EFFICIENT, HIERARCHICAL VIEWPOINT PLANNING STRATEGY FOR TERRESTRIAL LASER SCANNER NETWORKS

F. Jia, D. D. Lichti

DEEP LEARNING AND IMAGE PROCESSING FOR AUTOMATED CRACK DETECTION AND DEFECT MEASUREMENT IN UNDERGROUND STRUCTURES

F. Panella, J. Boehm, Y. Loo, A. Kaushik, D. Gonzalez

VERSATILE MOBILE AND STATIONARY LOW-COST APPROACHES FOR HYDROLOGICAL MEASUREMENTS

M. Kröhnert, A. Eltner

MASSIVE LINKING OF PS-INSAR DEFORMATIONS TO A NATIONAL AIRBORNE LASER POINT CLOUD

A. van Nuij, R. Lindenbergh, R. Hanssen

Lunch Break

Room: **Palavela**

Poster Session

6/6

2:30pm

-

4:00pm

TS WG II/6 - Large-scale Machine Learning for Geospatial Data Analysis

Session Chair: **Jan Dirk Wegner**

Room: **Garda A**

ROOFN3D: DEEP LEARNING TRAINING DATA FOR 3D BUILDING RECONSTRUCTION

A. Wichmann, A. Agoub, M. Kada

EFFECT OF THE TRAINING SET CONFIGURATION ON SENTINEL-2-BASED URBAN LOCAL CLIMATE ZONE CLASSIFICATION

C. Qiu, M. Schmitt, P. Ghamisi, X. X. Zhu

SEMANTIC SEGMENTATION AND UNREGISTERED BUILDING DETECTION FROM UAV IMAGES USING A DECONVOLUTIONAL NETWORK

S. Ham, Y. Oh, K. Choi, I. Lee

DEEP CONVOLUTIONAL NEURAL NETWORK FOR AUTOMATIC DETECTION OF DAMAGED PHOTOVOLTAIC CELLS

R. Pierdicca, E. S. Malinverni, F. Piccinini, M. Paolanti, A. Felicetti, P. Zingaretti

6/6 2:30pm **TS WG II/2 - Point Cloud Generation**
 - Session Chair: **Norbert Haala** Room: **Garda B**
 4:00pm

EXPLORING THE APPLICABILITY OF SEMI-GLOBAL MATCHING FOR SAR-OPTICAL STEREOGRAMMETRY OF URBAN SCENES
 H. Bagheri, M. Schmitt, P. d'Angelo, X. Zhu

POINT CLOUD AND DIGITAL SURFACE MODEL GENERATION FROM HIGH RESOLUTION MULTIPLE VIEW STEREO IMAGERY
 K. Gong, D. Fritsch

DENSE MATCHING COMPARISON BETWEEN CENSUS AND A CONVOLUTIONAL NEURAL NETWORK ALGORITHM FOR PLANT RECONSTRUCTION
 Y. Xia, J. Tian, P. d'Angelo, P. Reinartz

CHALLENGES IN FUSION OF HETEROGENEOUS POINT CLOUDS
 F. Bracci, M. Drauschke, S. Kühne, Z.-C. Marton

6/6 2:30pm **TS WG II/7 - Vision Metrology**
 - Session Chair: **Thomas Luhmann** Room: **Dolomiti**
 4:00pm

COMPARATIVE GEOMETRICAL ACCURACY INVESTIGATIONS OF HAND-HELD 3D SCANNING SYSTEMS – AN UPDATE
 T. Kersten, M. Lindstaedt, D. Starosta

INVESTIGATION OF GEOMETRIC PERFORMANCE OF AN INDOOR MOBILE MAPPING SYSTEM
 M. Maboudi, D. Bánhidi, M. Gerke

IMPROVING IMAGE MATCHING BY REDUCING SURFACE REFLECTIONS USING POLARISING FILTER TECHNIQUES
 N. Conen, H. Hastedt, O. Kahmen, T. Luhmann

TRAJECTORY BASED 3D FRAGMENT TRACKING IN HYPERVELOCITY IMPACT EXPERIMENTS
 E. Watson, H.-G. Maas

6/6 2:30pm **TS EU Projects**
 - Session Chair: **Fabio Remondino** Room: **Belvedere**
 4:00pm

- SLICE3D: “SLOVENIAN CENTRE OF EXCELLENCE ON 3D GEODATA” (<https://slice3d.si/>), Anka Lisec (Univ. Ljubljana, Slovenia)
- REPLICATE: “CREATIVE ASSET HARVESTING PIPELINE TO INSPIRE COLLECTIVE AUTHORIZING AND EXPERIMENTATION” (<http://replicate3d.eu/>), Fabio Poiesi (FBK Trento, Italy)
- iMARE: “ADVANCED VR, IMMERSIVE SERIOUS GAMES AND AUGMENTED REALITY AS TOOLS TO RAISE AWARENESS AND ACCESS TO EUROPEAN UNDERWATER CULTURAL HERITAGE” (<http://imareculture.eu/>), Dimitrios Skarlatos (Cyprus Univ. of Technology, Cyprus)
- ICT4LANDS: “INNOVATIONS FOR LAND TENURE” (<https://its4land.com/>), Mila Koeva (ITC/Twente Univ., The Netherlands)

Coffee Break

6/6 4:30pm - 6:00pm **TS WG II/4 - 3D Scene Reconstruction and Analysis**
Session Chair: Martin Weinmann **Room: Garda A**

SATELLITE IMAGE CLASSIFICATION OF BUILDING DAMAGES USING AIRBORNE AND SATELLITE IMAGE SAMPLES IN A DEEP LEARNING APPROACH
 D. A. Vicente Amorim Duarte, F. Nex, N. Kerle, G. Vosselman

SEMANTIC SEGMENTATION OF BUILDING ELEMENTS USING POINT CLOUD HASHING
 M. Chizhova, A. Gurianov, M. Hess, T. Luhmann, A. Brunn, U. Stilla

CLASSIFICATION OF POLE-LIKE OBJECTS USING POINT CLOUDS AND IMAGES CAPTURED BY MOBILE MAPPING SYSTEMS
 Y. Mori, K. Kohira, H. Masuda

FIRST STEPS TO AUTOMATED INTERIOR RECONSTRUCTION FROM SEMANTICALLY ENRICHED POINT CLOUDS AND IMAGERY
 L. S. Obrock, E. Gülch

6/6 4:30pm - 6:00pm **TS WG II/3 - Point Cloud Processing**
Session Chair: Martin Kada **Room: Garda B**

FULLY CONVOLUTIONAL NETWORKS FOR GROUND CLASSIFICATION FROM LIDAR POINT CLOUDS
 A. Rizaldy, C. Persello, C. Gevaert, S. Oude Elberink

USAGE OF MULTIPLE LIDAR SENSORS ON A MOBILE SYSTEM FOR THE DETECTION OF PERSONS WITH IMPLICIT SHAPE MODELS
 B. Borgmann, M. Hebel, M. Arens, U. Stilla

STOCHASTIC SURFACE MESH RECONSTRUCTION
 M. Ozendi, D. Akca, H. Topan

FILTERING PHOTOGRAMMETRIC POINT CLOUDS USING STANDARD LIDAR FILTERS TOWARDS DTM GENERATION
 Z. Zhang, M. Gerke, G. Vosselman, M. Y. Yang

6/6 4:30pm - 6:00pm **Joint Technical Session WG II/1 - II/8**
Session Chair: Pierre Grussenmeyer **Room: Dolomiti**

TOWARD AUTOMATIC GEOREFERENCING OF ARCHIVAL AERIAL PHOTOGRAMMETRIC SURVEYS
 S. Giordano, A. Le Bris, C. Mallet

POSSIBILITIES OF PROCESSING ARCHIVAL PHOTOGRAMMETRIC IMAGES CAPTURED BY ROLLEI 6006 METRIC CAMERA USING CURRENT METHOD
 A. Dlesk, P. Raeva, K. Vach

ARCHAEOLOGICAL FEATURE DETECTION FROM ARCHIVE AERIAL PHOTOGRAPHY WITH A SFM-MVS AND IMAGE ENHANCEMENT PIPELINE
 M. V. Peppas, J. P. Mills, K. D. Fieber, I. Haynes, S. Turner, A. Turner, M. Douglas, P. Bryan

FEATURE MATCHING OF HISTORICAL IMAGES BASED ON GEOMETRY OF QUADRILATERALS
 F. Maiwald, D. Schneider, F. Henze, S. Münster, F. Niebling

Poster Session

Room: Palavela

3D RECONSTRUCTION-REVERSE ENGINEERING- DIGITAL FABRICATION

L. Inzerillo, F. Di Paola

EXPLOITING MIRRORS IN 3D RECONSTRUCTION OF SMALL ARTEFACTS

G. Kontogianni, A.-T. Thomaidis, R. Chliverou, A. Georgopoulos

INTEGRATED PHOTOGRAMMETRIC SURVEY AND BIM MODELING FOR THE PROTECTION OF SCHOOL HERITAGE, APPLICATIONS ON A CASE STUDY

C. Palestini, A. Basso, L. Graziani

INTERACTIVE IMMERSIVE VIRTUAL MUSEUM: DIGITAL DOCUMENTATION FOR VIRTUAL INTERACTION

P. Clini, L. Ruggeri, R. Angeloni, M. Sasso

3D SURVEY IN COMPLEX ARCHAEOLOGICAL ENVIRONMENTS: AN APPROACH BY TERRESTRIAL LASER SCANNING

M. Lo Brutto, D. Ebolese, G. Dardanelli, R. Sciortino

A FRAMEWORK FOR ARCHITECTURAL HERITAGE HBIM SEMANTIZATION AND DEVELOPMENT

S. Brusaporci, P. Maiezza, A. Tata

FROM ARCHITECTURAL PHOTOGRAMMETRY TOWARD DIGITAL ARCHITECTURAL HERITAGE EDUCATION

A. H. Baik, A. K. Alitany

REPLICAS IN CULTURAL HERITAGE: 3D PRINTING AND THE MUSEUM EXPERIENCE

M. Ballarin, C. Balletti, P. Vernier

A RESTORATION ORIENTED HBIM SYSTEM FOR CULTURAL HERITAGE DOCUMENTATION: THE CASE STUDY OF PARMA CATHEDRAL

N. Bruno, R. Roncella

A NEW PROTOCOL FOR TEXTURE MAPPING PROCESS AND 2D REPRESENTATION OF ROCK-HEWN ARCHITECTURE

L. Carnevali, M. Carpicci, A. Angelini

MODERN AND CONTEMPORARY CULTURAL HERITAGE DOCUMENTATION AND KNOWLEDGE BY SURVEYING AND ITS REPRESENTATION

C. Balletti, M. Costa, F. Guerra, F. Martinello, P. Vernier

DIVERS-OPERATED UNDERWATER PHOTOGRAMMETRY: APPLICATIONS IN THE STUDY OF ANTARCTIC BENTHOS

P. Piazza, V. Cummings, I. Hawes, D. Lohrer, S. Marini, P. Marriott, F. Menna, E. Nocerino, A. Peirano, S. Schiaparelli

SELF-ASSEMBLED ROV AND PHOTOGRAMMETRIC SURVEYS WITH LOW COST TECHNIQUES

E. Costa, F. Guerra, P. Vernier

COLORIZING SENTINEL-1 SAR IMAGES USING A VARIATIONAL AUTOENCODER CONDITIONED ON SENTINEL-2 IMAGERY

M. Schmitt, L. H. Hughes, M. Körner, X. Zhu

OBJECT LOCALIZATION FOR SUBSEQUENT UAV TRACKING

D. Aglyamutdinova, R. Mazgutov, B. Vishnyakov

INFLUENCE OF DOMAIN SHIFT FACTORS ON DEEP SEGMENTATION OF THE DRIVABLE PATH OF AN AUTONOMOUS VEHICLE

R. P. A. Bormans, R. Lindenbergh, F. Karimi Nejadasl

PROCEDURE ENABLING SIMULATION AND IN-DEPTH ANALYSIS OF OPTICAL EFFECTS IN CAMERA-BASED TIME-OF-FLIGHT SENSORS

M. Baumgart, N. Druml, C. Consani

GRAPHICS-IMAGE MIXED METHOD FOR LARGE-SCALE BUILDINGS RENDERING

Y. Zhou, Q. Xu, S. Xing, X. Hu

ANALYSIS OF 3D BUILDING MODELS ACCURACY BASED ON THE AIRBORNE LASER SCANNING POINT CLOUDS

W. Ostrowski, M. Pilarska, J. Charyton, K. Bakula

INVESTIGATION OF JOINT VISIBILITY BETWEEN SAR AND OPTICAL IMAGES OF URBAN ENVIRONMENTS

L. H. Hughes, S. Auer, M. Schmitt

EVALUATION OF GMSH MESHING ALGORITHMS IN PREPARATION FOR HIGH-RESOLUTION WIND SPEED SIMULATIONS IN URBAN AREAS

M. M. Langheinrich

METRIC SCALE CALCULATION FOR VISUAL MAPPING ALGORITHMS

A. Hanel, A. Mitschke, R. Boerner, D. Van Opdenbosch, L. Hoegner, D. Brodie, U. Stilla

URBAN AREA CHANGE DETECTION USING TIME SERIES AERIAL IMAGES

C. Altuntas

INTEGRATED USE OF REMOTE SENSED DATA AND NUMERICAL CARTOGRAPHY FOR THE GENERATION OF 3D CITY MODELS

G. Bitelli, V. A. Girelli, A. Lambertini

RESEARCH ON THE DIGITAL SIMULATION FOR THE WHOLE PROCESS OF MARS EXPLORATION

L. Lyu, Q. Xu, Y. Zhou, S. Xing, W. Lu, Y. Zhao

ASTEROID (21) LUTETIA: SEMI-AUTOMATIC IMPACT CRATERS DETECTION AND CLASSIFICATION

M. Jenerowicz, M. Banaszkiewicz

CHANGE DETECTION IN REMOTE SENSING IMAGES USING CONDITIONAL ADVERSARIAL NETWORKS

M. Lebedev, V. Knyaz, A. Rubis, Y. Vizilter, O. Vygolov

ETALON IMAGES: UNDERSTANDING THE CONVOLUTION NEURAL NETWORKS

V. Molchanov, B. Vishnyakov, V. Gorbatshevich, Y. Vizilter

SINGLE-SHOT SEMANTIC MATCHER FOR UNSEEN OBJECT DETECTION

V. Gorbatshevich, Y. Vizilter, V. Knyaz, A. Moiseenko

THERMAL TEXTURE GENERATION AND 3D MODEL RECONSTRUCTION USING SFM AND GAN

V. V. Kniaz, V. A. Mizginov

Social Dinner

6/6 7:30 pm

Congress Centre Garden

THURSDAY, 6th JUNE

Oral Presentations

7/6	9:00am	PLENARY - Keynote and Companies	Room: Garda A
	10:30am	Session Chair: Isabella Toschi - Keynote speaker: Camillo Ressel (Vienna University of Technology, Austria): “ASSESSING THE ACCURACY OF DENSE IMAGE MATCHING” - Companies presentations: AERIAL PHOTOGRAMMETRY AND LASER SCAN INTEGRATION WITH 3DF ZEPHYR Andrea Alessi, 3DFlow NATION-WIDE OBLIQUE IMAGE ACQUISITION: CHALLENGES AND SOLUTIONS Frank van den Heuvel, Aerodata GENERATING A 3D POINT CLOUD FROM UAV IMAGES WITH GLOBAL MAPPER Myles LaBonte, BlueMarble	

Coffee Break

7/6	11:00am	TS WG II/6 - Large-scale Machine Learning for Geospatial Data Analysis	Room: Garda A
	12:30pm	Session Chair: Ribana Roscher LAKE ICE MONITORING WITH WEBCAMS M. Xiao, M. Rothermel, M. Tom, S. Galliani, E. Baltsavias, K. Schindler NEURAL NETWORKS FOR THE CLASSIFICATION OF BUILDING USE FROM STREET-VIEW IMAGERY D. Laupheimer, P. Tutzauer, N. Haala, M. Spicker AUTOMATIC LARGE-SCALE 3D BUILDING SHAPE REFINEMENT USING CONDITIONAL GENERATIVE ADVERSARIAL NETWORKS K. Bittner, P. d'Angelo, M. Körner, P. Reinartz RAPID OBJECT DETECTION SYSTEMS UTILISING DEEP LEARNING AND UNMANNED AERIAL SYSTEMS (UASS) D. Griffiths, J. Boehm	
7/6	11:00am	Joint Technical Session ARIDA - WG II/9 - Underwater Data Acquisition and Processing	Room: Garda B
	12:30pm	Session Chair: Hirofumi Chikatsu UNDERWATER PHOTOGRAMMETRY - POTENTIAL AND PITFALLS Armin Gruen (ETH Zurich, Switzerland) ON EVALUATION OF UNDER-WATER MEASUREMENT SYSTEMS USING DRY DOCK Seiji Matsumoto (Aero Asahi, Japan)	

THE APPLICATION OF AIRBORNE LIDAR BATHYMETRY (ALB) FOR RIVER MANAGEMENT

Shin-ichi Kaneta (Asia Air Survey, Japan)

PHOTOGRAMMETRY, A LINK ACROSS THE WATER SURFACE FOR 3D MODELLING OF PARTIALLY IMMERSED STRUCTURES

Fabio Menna (Bruno Kessler Foundation, Trento, Italy)

7/6

11:00am

-

12:30pm

TS WG II/3 - Point Cloud Processing

Session Chair: Mathieu Brédif

Room: Dolomiti

SUPERVISED OUTLIER DETECTION IN LARGE-SCALE MVS POINT CLOUDS FOR 3D CITY MODELING APPLICATIONS

C. Stucker, A. Richard, J. D. Wegner, K. Schindler

H-RANSAC: A HYBRID POINT CLOUD SEGMENTATION COMBINING 2D & 3D DATA

A. Adam, E. Chatzilari, S. Nikolopoulos, I. Kompatsiaris

DEEP MULTI-TASK LEARNING FOR TREE GENERA CLASSIFICATION

C. Ko, J. Kang, G. Sohn

COMPARISON OF POINT CLOUD REGISTRATION ALGORITHMS FOR BETTER RESULT ASSESSMENT - TOWARDS AN OPEN-SOURCE SOLUTION

E. Lachat, T. Landes, P. Grussenmeyer

Lunch Break

Room: Palavela

Poster Session

7/6

2:30pm

-

4:00pm

TS WG II/10 - 3D Mapping for Environmental & Infrastructure Monitoring

Session Chair: Vladimir V. Kniaz

Room: Garda A

MULTITEMPORAL ANALYSIS OF OBJECTS IN 3D POINT CLOUDS FOR LANDSLIDE MONITORING

A. Mayr, M. Rutzinger, C. Geitner

4D-SFM PHOTOGRAMMETRY FOR MONITORING SEDIMENT DYNAMICS IN A DEBRIS-FLOW CATCHMENT: SOFTWARE TESTING AND RESULTS COMPARISON

S. Cucchiaro, E. Maset, A. Fusiello, F. Cazorzi

MONITORING OF PROGRESSIVE DAMAGE IN BUILDINGS USING LASER SCAN DATA

I. Puente, R. Lindenbergh, A. Van Naticjine, R. Esposito, R. Schipper

SOME TECHNICAL ASPECTS RELATED TO THE APPLICATION OF SFM PHOTOGRAMMETRY IN HIGH MOUNTAIN

M. Scaioni, J. Crippa, M. Corti, L. Barazzetti, D. Fugazza, G. Diolaiuti, M. Cernuschi

7/6	2:30pm	TS WG II/4 : Technical Session WG II/4 - 3D Scene Reconstruction and Analysis	
	-	Session Chair: Bruno Vallet	Room: Garda B
	4:00pm		
		OBJECT DETECTION FROM MMS IMAGERY USING DEEP LEARNING FOR GENERATION OF ROAD ORTHOPHOTOS	
		Y. Li, M. Sakamoto, T. Shinohara, T. Satoh	
		THERMAL TEXTURE SELECTION AND CORRECTION FOR BUILDING FACADES INSPECTION BASED ON THERMAL RADIANT CHARACTERISTICS	
		D. Lin, M. Jarzabek-Rychard, D. Schneider, H.-G. Maas	
		RESIDUAL SHUFFLING CONVOLUTIONAL NEURAL NETWORKS FOR DEEP SEMANTIC IMAGE SEGMENTATION USING MULTI-MODAL DATA	
		K. Chen, M. Weinmann, X. Gao, M. Yan, S. Hinz, B. Jutzi, M. Weinmann	
		LAYOUT SLAM WITH MODEL BASED LOOP CLOSURE FOR 3D INDOOR CORRIDOR RECONSTRUCTION	
		A. Baligh Jahromi, G. Sohn, J. Jung, M. Shahbazi, J. Kang	

7/6	2:30pm	TS WG II/8 - Data Acquisition and Processing in Cultural Heritage	
	-	Session Chair: Fulvio Rinaudo	Room: Dolomiti
	4:00pm		
		CAN WE USE LOW-COST 360 DEGREE CAMERAS TO CREATE ACCURATE 3D MODELS?	
		L. Barazzetti, M. Previtali, F. Roncoroni	
		IMPROVING SPHERICAL PHOTOGRAMMETRY USING 360° OMNI-CAMERAS: USE CASES AND NEW APPLICATIONS	
		G. Fangi, E. S. Malinverni, R. Pierdicca, M. Sturari	
		FOCUSING ON OUT-OF-FOCUS – ASSESSING DEFOCUS ESTIMATION ALGORITHMS FOR THE BENEFIT OF AUTOMATED IMAGE MASKING	
		G. Verhoeven	
		FISHEYE MULTI-CAMERA SYSTEM CALIBRATION FOR SURVEYING NARROW AND COMPLEX ARCHITECTURES	
		L. Perfetti, C. Polari, F. Fassi	

7/6	4:00pm	CLOSING: Closing & Awards	
	-	Session Chair: Fabio Remondino	Room: Garda A
	4:30pm		

Poster Session

			Room: Palavela
7/6	1:30pm	SPHERICAL IMAGES FOR CULTURAL HERITAGE: SURVEY AND DOCUMENTATION WITH THE NIKON KM360	
	-		
	2:30pm	C. Gottardi, F. Guerra	
		REPRESENTING WITH LIGHT. VIDEO PROJECTION MAPPING FOR CULTURAL HERITAGE	
		C. Barbiani, F. Guerra, T. Pasini	

HBIM METHODOLOGY AS A BRIDGE BETWEEN ITALY AND ARGENTINA

A. Moreira, R. Quattrini, G. Maggiolo, R. Mammoli

INVESTIGATION INTO THE USE OF ACTION CAMERAS IN THE DOCUMENTATION OF ARCHITECTURAL DETAILS - THE CASE STUDY OF A BAROQUE CHAMBER

J. Markiewicz, S. Łapiński, M. Pilarska, R. Bieńkowski, A. Kaliszewska

EXTENDED MULTISCALE IMAGE SEGMENTATION FOR CASTELLATED WALL MANAGEMENT

M. Sakamoto, T. Masahiko, S. Chhatkuli, T. Satoh

HBIM TO VR. SEMANTIC AWARENESS AND DATA ENRICHMENT INTEROPERABILITY FOR PARAMETRIC LIBRARIES OF HISTORICAL ARCHITECTURE

R. Quattrini, C. Battini, R. Mammoli

INTEGRATED IMAGING APPROACHES SUPPORTING THE EXCAVATION ACTIVITIES. MULTI-SCALE GEOSPATIAL DOCUMENTATION IN HIERAPOLIS (TK)

A. Spanò, F. Chiabrando, G. Sammartano, L. Teppati

REVERSE INFORMATION MODELING FOR HISTORIC ARTEFACTS: TOWARDS THE DEFINITION OF A LEVEL OF ACCURACY FOR RUINED HERITAGE

C. Santagati, M. Lo Turco, R. Garozzo

RENAISSANCE HBIM IN POGGIO A CAIANO

C. M. Bolognesi, S. Garagnani

INCORRECT MATCH DETECTION METHOD FOR ARCTIC SEA-ICE RECONSTRUCTION USING UAV IMAGES

J.-I. Kim, H.-c. Kim

DEVELOPMENT OF UAV PHOTOGRAMMETRY METHOD BY USING SMALL NUMBER OF VERTICAL IMAGES

Y. Kunii

VERTICAL ACCURACY EVALUATION OF ASTER GDEM2 OVER A MOUNTAINOUS AREA BASED ON UAV PHOTOGRAMMETRY

Y. Liang, Y. Qu, D. Guo

FOREST COVER CLASSIFICATION USING GEOSPATIAL MULTIMODAL DATA

K. Suzuki, U. Rin, Y. Maeda, H. Takeda

OBJECT ASSESSMENT OF AIRBORNE HYPERSPECTRAL HYPESX IMAGES AND ALS DATA FOR THE IDENTIFICATION OF NATURA 2000 HABITAT 6520: MOUNTAIN YELLOW TRisetum AND BENT-GRASS HAY MEADOWS (POLYGONO-TRisetION AND ARRHENATHERION)

B. Zagajewski, I. Plaza, A. Jarocińska, Ł. Ślawik, A. Błońska, T. Nowak, B. Tokarska-Guzik, A. Sabat-Tomala, M. Kycko

IDENTIFICATION OF THE EXPANSIVE SPECIES RUBUS SPP. USING THE RANDOM FOREST AND SUPPORT VECTOR MACHINES ALGORITHMS

M. Kycko, B. Zagajewski, A. Jarocińska, A. Sabat-Tomala, E. Raczko, Ł. Ślawik, A. Pasierbiński, Ł. Folcik, A. Błońska, T. Nowak, B. Tokarska-Guzik