Date: Monday, 10/Jun/2019

9:30am - 10:30am Waaier 1+2	**Opening** Session Chair: **George Vosselman**
11:00am - 12:30pm Waaier 2	**SEM-01: Orientation and Matching** Session Chair: **Helmut Mayer** Session Chair: **Norbert Haala** Semantics3D session
11:00am - 12:30pm Waaier 1	**UAVG-01: UAV in Agriculture and Forestry I** Session Chair: **Francesco Nex**
1:15pm - 1:45pm Waaier 2	**IS-01: Gold sponsor presentation: Pix4D** Session Chair: **Francesco Nex** Industry session
1:30pm - 2:30pm Foyer	**PS-01: Poster session** Posters of the workshops Semantics3D and UAV-g
2:30pm - 3:30pm Waaier 4	**IWIDF-01: Land Use and Land Cover** Session Chair: **Xinlian Liang** Session Chair: **He Zhang**
2:30pm - 3:30pm Waaier 2	**SEM-02: Deep Learning from Terrestrial Data** Session Chair: **Bruno Vallet** Session Chair: **Martin Weinmann** Semantics3D session
2:30pm - 3:30pm Waaier 3	**UAVG-02a: UAV Photogrammetry I** Session Chair: **Costas Armenakis** Session Chair: **Ewelina Rupnik**
2:30pm - 3:30pm Waaier 1	**UAVG-02b: Precision Farming with UAVs I** Session Chair: **Arko Lucieer** Session Chair: **Matthew McCabe**
4:00pm - 5:30pm Waaier 4	**IWIDF-02: Applications of Multi-Source Data Fusion** Session Chair: **Wei Yao** Session Chair: **He Zhang**
4:00pm - 5:30pm Waaier 2	**SEM-03: Classification for Topographic Applications** Session Chair: **Uwe M. Stilla** Session Chair: **Yuliang Lan** Semantics3D session, supported by VOLTA
4:00pm - 5:30pm Waaier 1	**UAVG-03a: UAV Lidar and SAR: Uses and Best Practices** Session Chair: **Sander Oude Elberink** Session Chair: **Eija Honkavaara** Session of the UAV-g workshop. 18 minutes are available for each presentation, including time for questions and switching between presentations.
4:00pm - 5:30pm Waaier 3	**UAVG-03b: UAV Flight Planning and Navigation** Session Chair: **Filiberto Chiabrando** Session Chair: **Dorota Iwaszczuk**

Date: Tuesday, 11/Jun/2019

9:00am - 10:30am Waaier 4	**IND-01: Indoor Mapping I** Session Chair: **Zhizhong Kang** Session Chair: **Stephan Nebiker** Indoor3D session
9:00am - 10:30am Waaier 1+2	**JS-01: Semantic Analysis of UAV and Oblique Aerial Images** Session Chair: **Franz Rottensteiner** Session Chair: **Petra Helmholz** Joint session of UAV-g, Semantics3D, and IWIDF
11:00am - 12:30pm Waaier 1	**JS-02: Building Models** Session Chair: **Zhizhong Kang** Session Chair: **Uwe Soergel** Joint session of Indoor3D, Semantics3D, and IWIDF
11:00am - 12:30pm Waaier 4	**UAVG-04a: Towards Autonomous Navigation** Session Chair: **Davide Antonio Cucci** Session Chair: **Fabio Remondino**
11:00am - 12:30pm Waaier 2	**UAVG-04b: Environmental Monitoring** Session Chair: **Görres Grenzdörffer** Session Chair: **Caroline Gevaert**
1:15pm - 2:15pm Waaier 2	**IS-02: Gold sponsor presentations: nFrames and Geodyn** Session Chair: **Michael Ying Yang** Industry session
1:30pm - 2:30pm Foyer	**PS-02: Poster session** Posters of the workshops Semantics3D, UAV-g, IWIDF, and Indoor3D
2:30pm - 3:30pm Waaier 3	**IND-02: Positioning and Navigation I** Session Chair: **Kourosh Khoshelham** Session Chair: **Cheng Wang** Indoor3D session
2:30pm - 3:30pm Waaier 4	**IWIDF-03: Deep Learning and Remote Sensing Data Analysis** Session Chair: **Wei Yao**

2:30pm - 3:30pm Waaier 1	**SEM-04: Building Models and Facades** Session Chair: **Markus Gerke** Session Chair: **Jie Shan** Semantics3D session
2:30pm - 3:30pm Carré 2K	**UAVG-05a: UAV in Photogrammetry and Education** Session Chair: **Costas Armenakis** Session Chair: **Taejung Kim**
2:30pm - 3:30pm Waaier 2	**UAVG-05b: UAV in Agriculture and Forestry II** Session Chair: **Eija Honkavaara** Session Chair: **Arko Lucieer**
4:00pm - 5:30pm Waaier 2	**IND-03: Indoor Scene Understanding** Session Chair: **Jonathan Li** Session Chair: **Sisi Zlatanova** Indoor3D session
4:00pm - 5:30pm Waaier 3	**SEM-05: Image Sequences and Tracking** Session Chair: **Michael Ying Yang** Session Chair: **Siavash Hosseinyalamdary** Semantics3D session
4:00pm - 5:30pm Waaier 1	**UAVG-06a: Precision Farming with UAVs II** Session Chair: **Görres Grenzdörffer** Session Chair: **Matthew McCabe** Session of the UAV-g workshop. 18 minutes are available for each presentation, including time for questions and switching between presentations.
4:00pm - 5:30pm Waaier 4	**UAVG-06b: UAV for Emergency Response** Session Chair: **Norman Kerle** Session Chair: **Daniele Giordan**
Date: Wednesday, 12/Jun/2019	
9:00am - 10:30am Waaier 4	**IND-04: Indoor Modelling** Session Chair: **Lucía Díaz Vilariño** Session Chair: **Edward Verbree** Indoor3D session
9:00am - 10:30am Waaier 2	**LS-01: Machine & Deep Learning** Session Chair: **Jan Boehm** Session Chair: **David Griffiths** Laser Scanning session
9:00am - 10:30am Waaier 1	**UAVG-07a: Scene Understanding from UAV Data** Session Chair: **Claudio Persello** Session Chair: **Ewelina Rupnik**
9:00am - 10:30am Waaier 3	**UAVG-07b: UAVs in H2020 Projects** Session Chair: **Francesco Nex**
11:00am - 12:30pm Waaier 4	**IND-05: Virtual and Augmented Reality** Session Chair: **Kourosh Khoshelham** Session Chair: **Avideh Zakhor** Indoor3D session
11:00am - 12:30pm Waaier 3	**ISSDQ-01: Spatial Data Quality: The Wider Context** Session Chair: **Alfred Stein** Session Chair: **Wenzhong Shi**
11:00am - 12:30pm Waaier 2	**LS-02: Change Detection** Session Chair: **Wei Yao** Session Chair: **Gottfried Mandlburger** Laser Scanning session
11:00am - 12:30pm Waaier 1	**UAVG-08a: Integration of UAV Data with Other Sources** Session Chair: **Norbert Haala** Session Chair: **Sander Oude Elberink**
11:00am - 12:30pm Carré 2K	**UAVG-08b: ITS4LAND I** Session Chair: **Mila Koeva**
1:15pm - 2:15pm Waaier 2	**IS-03: Gold sponsor presentations:Riegl and Zoller & Fröhlich** Session Chair: **Sander Oude Elberink** Industry session
1:30pm - 2:30pm Foyer	**PS-03: Poster session** Posters of the workshops Laser Scanning and ISSDQ
2:30pm - 3:30pm Waaier 4	**IND-06: Positioning and Navigation II** Session Chair: **Beril Sirmacek** Session Chair: **Kai-Wei Chiang** Indoor3D session
2:30pm - 3:30pm Waaier 3	**ISSDQ-02: Spatial Data Quality on Images** Session Chair: **Alfred Stein** Session Chair: **Mahmoud Delevar**
2:30pm - 3:30pm Waaier 2	**LS-03: Registration and Change Detection** Session Chair: **Bisheng Yang** Session Chair: **Roderik Lindenbergh** Laser Scanning session
2:30pm - 3:30pm	

Waaier 1	**UAVG-09a: UAV for Mapping: Experiences and Best Practices** Session Chair: **Markus Gerke** Session Chair: **Caroline Gevaert**
2:30pm - 3:30pm Carré 2K	**UAVG-09b: ITS4LAND II** Session Chair: **Mila Koeva**
4:00pm - 5:30pm Waaier 4	**IND-07: Indoor Mapping II** Session Chair: **Ville Lehtola** Session Chair: **Sisi Zlatanova** Indoor3D session
4:00pm - 5:30pm Waaier 3	**ISSDQ-03: The Latest in Methodology of Spatial Data Quality** Session Chair: **Wenzhong Shi** Session Chair: **Mahmoud Delevar**
4:00pm - 5:30pm Waaier 2	**LS-04: Environmental Mapping** Session Chair: **Martin Rutzinger** Session Chair: **Michael James Olsen** Laser Scanning session
4:00pm - 5:30pm Waaier 1	**UAVG-10: UAV Photogrammetry II** Session Chair: **Francesco Nex**
Date: Thursday, 13/Jun/2019	
9:00am - 10:30am Waaier 4	**iSSDQ-04: Novel Applications of Spatial Data Quality** Session Chair: **Mahmoud Delevar** Session Chair: **Wenzhong Shi**
9:00am - 10:30am Waaier 1	**JS-03: Single Photon Lidar** Session Chair: **Martin Rutzinger** Session Chair: **Cheng Wang** Joint session of Laser Scanning and EuroCOW-M3DMaN
9:00am - 10:30am Waaier 3	**PRSM-01: Planetary Mapping** Session Chair: **Kaichang Di** Session Chair: **Jürgen Oberst**
9:00am - 10:30am Waaier 2	**SGA-01: Imagery-based applications** Session Chair: **Mila Koeva** Session Chair: **Giorgio Agugiaro** SmartGeoApps session
11:00am - 12:30pm Waaier 2	**COW-01: Orientation and Mapping** Session Chair: **Jan Skaloud** Session Chair: **Andrea Maria Lingua** EuroCOW-M3DMaN session
11:00am - 12:30pm Carré 2K	**ISSDQ-05: Spatial Data Quality and Uncertainty Assessment in Smart Cities** Session Chair: **Wenzhong Shi** Session Chair: **Alfred Stein** Discussion session
11:00am - 12:30pm Waaier 1	**JS-04: Big Data** Session Chair: **Jan Boehm** Session Chair: **Eric Guilbert** Joint session of Laser Scanning and C3M&GBD
11:00am - 12:30pm Waaier 3	**PRSM-02: Planetary Photogrammetry** Session Chair: **Bo Wu** Session Chair: **Christian Wöhler**
11:00am - 12:30pm Waaier 4	**SGA-02: Energy, BIM** Session Chair: **Giorgio Agugiaro** Session Chair: **Mila Koeva** SmartGeoApps session
1:15pm - 2:15pm Waaier 2	**IS-04: Gold sponsor presentations: IGI and Agisoft** Session Chair: **Siavash Hosseinyalamdary** Industry session
1:30pm - 2:30pm Foyer	**PS-04: Poster session** Posters of the workshops Laser Scanning, EuroCOW-M3DMaN, and SmartGeoApps
2:30pm - 3:30pm Waaier 4	**COW-02: Camera Systems** Session Chair: **Ismael Colomina** Session Chair: **Julian Smit** EuroCOW-M3DMaN session
2:30pm - 3:30pm Waaier 1	**LS-05: Segmentation and Detection** Session Chair: **Wen Xiao** Session Chair: **Mario Soilán Rodríguez** Laser Scanning session
2:30pm - 3:30pm Waaier 3	**PRSM-03: Planetary Remote Sensing** Session Chair: **Kaichang Di** Session Chair: **Cristina Re**
2:30pm - 3:30pm Waaier 2	**SGA-03: Urban applications** Session Chair: **Jérôme Kaempf** Session Chair: **Giorgio Agugiaro** SmartGeoApps session
4:00pm - 5:30pm	

Waaier 3	**C3MGBD-02: Remote Sensing Solutions** Session Chair: **Eric Guilbert** Session Chair: **Ken Arroyo Ohori**
4:00pm - 5:30pm Waaier 4	**COW-03: Navigation and Dynamic Networks** Session Chair: **Steffen Schön** Session Chair: **Craig Glennie** EuroCOW-M3DMaN session
4:00pm - 5:30pm Waaier 1	**LS-06: Intensity and Full Waveform** Session Chair: **Martin Weinmann** Session Chair: **Kourosh Khoshelham** Laser Scanning session
4:00pm - 5:30pm Carré 2K	**PRSM-04: Feature Extraction from Planetary Data** Session Chair: **Randolph Kirk** Session Chair: **Emerson Speyerer**
4:00pm - 5:30pm Waaier 2	**SGA-04: Traffic Applications** Session Chair: **Mila Koeva** Session Chair: **Giorgio Agugiaro** SmartGeoApps session
Date: Friday, 14/Jun/2019	
9:00am - 10:30am Waaier 4	**C3MGBD-03: Road Network** Session Chair: **Maria Antonia Brovelli** Session Chair: **Daniele Oxoli**
9:00am - 10:30am Waaier 2	**COW-04: Calibration I** Session Chair: **Norbert Haala** Session Chair: **Antonio Maria Garcia Tommaselli** EuroCOW-M3DMaN session
9:00am - 10:30am Waaier 1	**JS-05: SAR in Cryosphere and Hydrosphere** Session Chair: **Kohei Cho** Session Chair: **Uwe Soergel** Joint session of CHGCS and SarCon
9:00am - 10:30am Waaier 3	**PRSM-05: Chang'E-4 Mission** Session Chair: **Jürgen Oberst** Session Chair: **Bo Wu**
11:00am - 12:30pm Waaier 4	**C3MGBD-04: Crowdsourced and VGI Data I** Session Chair: **Cidália Costa Fonte** Session Chair: **Serena Coetzee**
11:00am - 12:30pm Carré 2K	**CHGCS-01: The Changing Cryosphere I** Session Chair: **Rongxing Li** Session Chair: **Hansheng Wang**
11:00am - 12:30pm Waaier 2	**COW-05: Calibration II** Session Chair: **Michael Cramer** Session Chair: **Naser El-Sheimy** EuroCOW-M3DMaN session
11:00am - 12:30pm Waaier 1	**HYPER-01: Analysis of Hyperspectral Data** Session Chair: **Eija Honkavaara** Session Chair: **Martin Weinmann** HyperMLPA session
11:00am - 12:30pm Waaier 3	**SARCON-01: Monitoring and object detection** Session Chair: **Michele Crosetto** Session Chair: **Uwe Soergel**
1:30pm - 2:30pm Foyer	**PS-05: Poster session** Posters of the workshops C3M&GBD, CHGCS, HyperMLPA, and SarCon
2:30pm - 3:30pm Waaier 2	**C3MGBD-05: Crowdsourced and VGI Data II** Session Chair: **Berk Anbaroglu** Session Chair: **Paul Vincent Kuper**
2:30pm - 3:30pm Waaier 4	**CHGCS-02: Hydrosphere and Applications** Session Chair: **Yinsheng Zhang** Session Chair: **Marco Scaioni**
2:30pm - 3:30pm Waaier 1	**HYPER-02: Land Cover and Land Use Classification** Session Chair: **Rupert Müller** Session Chair: **Sina Keller** HyperMLPA session
2:30pm - 3:45pm Waaier 3	**SARCON-02: Urban areas** Session Chair: **Uwe Soergel** Session Chair: **Michele Crosetto**
4:00pm - 5:30pm Waaier 1	**HYPER-03: Environmental Mapping** Session Chair: **Ralf Reulke** Session Chair: **Martin Weinmann** HyperMLPA session
4:00pm - 5:45pm Waaier 4	**CHGCS-03: The Changing Cryosphere II** Session Chair: **Beata Maria Csatho** Session Chair: **Gang Qiao**

Presentations

Opening

Time: Monday, 10/Jun/2019: 9:30am - 10:30am · *Location:* Waaier 1+2
Session Chair: George Vosselman

Welcome on behalf of the ISPRS

Christian Heipke
ISPRS President

Keynote: Geospatial Technologies for Urban Resilience in Africa: Insights from the Field

Edward Anderson
World Bank, Tanzania

Presentation of the Best Paper 2018 for the U.V. Helava Award, published in the ISPRS Journal of Photogrammetry and Remote Sensing, and sponsored by Leica Geosystems AG and Elsevier BV.

Charles Toth
ISPRS Second Vice President

Presentation of the Best Papers 2017 and 2018 for the Jack Dangermond Award, published in the ISPRS International Journal of Geo-Information, and sponsored by ESRI and MDPI AG.

Lena Halounova
ISPRS Secretary General

The ISPRS Congress 2020 in Nice

Nicolas Paparoditis
ISPRS Congress Director

SEM-01: Orientation and Matching

Time: Monday, 10/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 2
Session Chair: Helmut Mayer
Session Chair: Norbert Haala

LGS: Local Geometrical Structure Based Interest Point Matching for Wide-Baseline Imagery in Urban Area

Min Chen, Qing Zhu, Shaohua Yan, Yitao Zhao
Southwest Jiaotong University, China, People's Republic of

Precise Disparity Estimation for Narrow Baseline Stereo Based on Multiscale Superpixels and Phase Correlation

Zhen Ye[1], Yusheng Xu[1], Ludwig Hoegner[1], Xiaohua Tong[2], Uwe Stilla[1]
[1]Photogrammetry and Remote Sensing, Technische Universität München, Munich 80333, Germany; [2]College of Surveying and Geo-Informatics, Tongji University, Shanghai 200092, China

Reduction of the Fronto-Parallel Bias for Wide-Baseline Semi-Global Matching

Lukas Roth, Helmut Mayer
Bundeswehr University Munich, Germany

FOSS4G DATE for DSM Generation: Sensitivity Analysis of the Semi Global Block Matching Parameters

Lorenzo Lastilla[1,2], Roberta Ravanelli[1], Francesca Fratarcangeli[1], Martina Di Rita[1], Andrea Nascetti[3], Mattia Crespi[1,2]
[1]Geodesy and Geomatics Division, DICEA - University of Rome “La Sapienza”, Rome, Italy; [2]Sapienza School for Advanced Studies, Rome, Italy; [3]Geoinformatics Division, Department of Urban Planning and Environment - KTH Royal Institute of Technology, Stockholm, Sweden

UAVG-01: UAV in Agriculture and Forestry I

Time: Monday, 10/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 1
Session Chair: Francesco Nex

Keynote: Unmanned Aerial Vehicles in Agriculture and Forestry Monitoring: Meeting the Expectations?

Pablo Zarco-Tejada
University of Melbourne, Australia

Tree Species Classification Based on 3D Spectral Point Clouds and Orthomosaics Acquired by Snapshot Hyperspectral UAS Sensor

Chris Iseli, Arko Lucieer
University of Tasmania, Australia

Evaluation of Multiple Linear Regression Model to Estimate DBH of Trees Using Data from a Lightweight Laser Scanning System Onboard a UAV

Marcela do Valle Machado[1], Antonio Maria Garcia Tommaselli[2], Vilma Mayumi Tachibana[3], Rorai Pereira Martins Neto[1], Mariana Batista Campos[1]
[1]Post Graduate Program in Cartographic Science, São Paulo State University (UNESP), Presidente Prudente-SP, Brazil; [2]Department of Cartography, São Paulo State University (UNESP), Presidente Prudente -SP, Brazil; [3]Department of Statistics, São Paulo State University (UNESP), Presidente Prudente -SP, Brazil

On The Derivation of Crop Heights from Multitemporal UAV Based Imagery

Diana Becirevic[1], Lasse Klingbeil[1], Andreas Honecker[2], Henrik Schumann[2], Uwe Rascher[3], Jens Léon[2], Heiner Kuhlmann[1]
[1]Institute of Geodesy and Geoinformation, University of Bonn, Germany; [2]INRES Plantbreeding, University of Bonn, Germany; [3]Forschungszentrum Jülich, Institute of Bio- and Geosciences, IBG-[2]Plant Sciences, Germany

IS-01: Gold sponsor presentation: Pix4D

Time: Monday, 10/Jun/2019: 1:15pm - 1:45pm · *Location:* Waaier 2
Session Chair: Francesco Nex

1:15pm - 1:45pm

Automating photogrammetry pipelines: Pix4Dengine, new developments and challenges

Piotr Dobrowolski
Pix4D SA

PS-01: Poster session

Time: Monday, 10/Jun/2019: 1:30pm - 2:30pm · *Location:* Foyer

Generation of A Benchmark Dataset Using Historical Photographs for An Automated Evaluation of Different Feature Matching Methods

Ferdinand Maiwald
Institute of Photogrammetry and Remote Sensing, TU Dresden, Germany

Long Line Cliff Topography Measurement by Using Structure from Motion Photogrammetry

Cihan Altuntas
Konya Technical University, Turkey

Active Shape Model Precision Analysis of Vehicle Detection in 3D LiDAR Point Clouds

Steffen Busch
Leibniz Universität Hannover, Germany

Quality Prediction of Dense Points Generated by Structure from Motion for High-Quality and Efficient As-Is Model Reconstruction

Ryota Moritani[1], Satoshi Kanai[1], Hiroaki Date[1], Yasuhito Niina[2], Ryohei Honma[2]
[1]Graduate School of Information Science and Technology, Hokkaido University, Japan; [2]Asia Air Survey Co., Ltd.

Precise Aerial Image Orientation using SAR Ground Control Points and Mapping of Urban Landmarks for Autonomous Driving

Franz Kurz, Thomas Krauß, Hartmut Runge, Dominik Rosenbaum, Pablo d'Angelo
DLR - German Aerospace Center, Germany

Geometric Object Based Building Reconstruction from Satellite Imagery Derived Point Clouds

Zhixin Li, Bo Xu, Jie Shan
Purdue University, United States of America

3D Hazard Analysis and Characterization of Landslide Motion Mechanism with a UAV

Efstratios Karantanellis[1], Vasileios Marinos[1], Emmanouel Vassilakis[2]
[1]Laboratory of Engineering Geology and Hydrogeology, Faculty of Geology, Aristotle University of Thessaloniki, Greece; [2]Faculty of Geology and Geoenviromment, National and Kapodistrian University of Athens, Greece

Automatic Apple Tree Blossom Estimation from UAV RGB Imagery

Aina Tubau Comas[1], João Valente[2], Lammert Kooistra[3]
[1]Laboratory of Geo-information Science and Remote Sensing, Wageningen University & Research, Netherlands, The; [2]Laboratory of Geo-information Science and Remote Sensing, Wageningen University & Research, Netherlands, The; [3]Laboratory of Geo-information Science and Remote Sensing, Wageningen University & Research, Netherlands, The

Computational Time Assessment for Tree Crown Extraction from Imagery using Geographic Object-Based Image Analysis

Jefferson Adetokunbo Okojie[1], Agbor Esong Effiom[2], Ekow Nyamekye Tawiah[2], Ilamosi Juliet Akpejiori[2]
[1]GeoNet Research Initiative, Nigeria; [2]Faculty of Geoinformation Science and Earth Observation, Enschede, The Netherlands

Crop Row Detection Procedure Using Low-Cost UAV Imagery System

Mohamed Hassanein, Maan Khedr, Naser El-Sheimy
University of Calgary, Canada

Determination of Surface Velocity of a River using Videos captured from Unmanned Aerial System (UAS)

Sanjeevan Shrestha[1], Mahesh Thapa[2], Leon Gaw Yan Feng[4], Sarah Abdelkader[5], Dr. Torsten Prinz[3], Dr. Jan Lehmann[3], Holzer Fritze[3]
[1]Land Management Training Centre, Government of Nepal; [2]Survey Department, Government of Nepal; [3]University of Munster, Germany; [4]Universidade Nova de Lisboa, Portugal; [5]University of Jaume I, Spain

Estimating Crop Density from Multi-Spectral UAV Imagery in Maize Crop

Daniela Stroppiana[1], Monica Pepe[1], Mirco Boschetti[1], Alberto Crema[1,2], Gabriele Candiani[1], Daniele Giordan[3], Marco Baldo[3], Paolo Allasia[3], Lorenzo Monopoli[4]
[1]IREA-CNR, Italy; [2]Department of Agricultural and Forestry scieNcEs (DAFNE), University of Tuscia, Italy; [3]IRPI-CNR, Italy; [4]IBF Servizi S.p.a., Italy

Lava Dome Changes Detection at Agung Mountain During High Level of Volcanic Activity Using UAV Photogrammetry

Ruli Andaru[1,2], Jiann Yeou Rau[2]
[1]Department of Geodetic Engineering, Gadjah Mada University, Indonesia; [2]Department of Geomatics, National Cheng Kung University, Taiwan

Mass Movements Detection from UAV Images Analysis

Villie Morocho[1], Andres España[2], Carolina Serrano[2], Rosario Achig[1], Joep Crompvoets[3]
[1]Computer Science Department, University of Cuenca, Cuenca, Ecuador; [2]Engineering Faculty, University of Cuenca, Cuenca, Ecuador; [3]Public Governance Institute, KU LEUVEN, Leuven, Belgium

Opportunities of UAVs in Orchard Management

Chenglong Zhang[1,2], Joao Valente[1], Lammert Kooistra[1], Leifeng Guo[2], Wensheng Wang[3]
[1]Wageningen University & Research, Netherlands, The; [2]Agriculture Information Institute, Chinese academy of agricultural science, China; [3]Key Laboratory of Agricultural Big Data, Chinese academy of agricultural science, China

The Crown Diameter Estimation from Fixed Wing Type of UAV Imagery

Alžbeta Grznárová[1], Martin Morkoš[1,2], Peter Surový[2], Martin Slavík[2], Marek Pondelík[1], Ján Merganič[3]
[1]Department of Forest Management and Geodesy, Faculty of Forestry, Technical University in Zvolen, 96053 Zvolen, Slovakia; [2]Faculty of Forestry and Wood Sciences, Czech University of Life Sciences Prague, 165 21 Praha 6–Suchdol, Czech Republic; [3]Department of Forest Harvesting, Logistics and Ameliorations, Faculty of Forestry, Technical University in Zvolen, 96053 Zvolen, Slovakia

UAV and Satellite Imagery Applied to Alien Species Mapping in NW Spain

Joaquín Martínez-Sánchez[1,2], Luis M. González-de Santos[1,2], Ana Novo[1], Higinio González-Jorge[2,3]
[1]Minig and Energy School, University of Vigo, Spain; [2]Centro de Innovación Aeroespacial de Galicia; [3]Aerospace Engineering School, University of Vigo, Spain

Ultra-High Spatial Resolution UAV-Based Imagery to Predict Biomass in Temperate Grasslands

Ulrike Lussem[1], Andreas Bolten[1], Jannis Menne[1], Martin Leon Gnyp[2], Georg Bareth[1]
[1]Institute of Geography, GIS & Remote Sensing Group, University of Cologne, Albertus-Magnus-Platz, 50923 Cologne, Germany; [2]Research Center for Crop Nutrition Hanninghof, Yara International ASA, 48249 Dülmen, Germany

Shadow Detection Hyperspectral Images Acquired by UAV

Nilton Nobuhiro Imai, Antonio M. G. Tommaselli, Adilson Berveglieri, Érika A. S. Moriya
Univ. of Sao Paulo State, Brazil

UAV based Multi Seasonal Deciduous Tree Species Analysis in the Hainich National Park using Multi Temporal and Point Cloud Curvature Features

Sören Hese[1], Christian Thiel[2], Andreas Henkel[3]
[1]Friedrich-Schiller-University Jena, Germany; [2]Deutsches Zentrum für Luft- und Raumfahrt (DLR); [3]Nationalpark Verwaltung Hainich, Bad Langensalza, Germany

Mapping Artificial Terraces from Image Matching Point Cloud in Loess Plateau of China

Jiaming Na[1,2], Xin Yang[1], Xuan Fang[1,3], Guoan Tang[1], Norbert Pfeifer[2]
[1]School of Gegraghy, Nanjing Normal University, 210023 Nanjing, China; [2]Department of Geodesy and Geoinformation, Technische Universität Wien, 1040 Vienna, Austria; [3]School of Environment Science, Nanjing Xiaozhuang University, 211171 Nanjing, China

A Normalized Surf for Multispectral Image Matching and Band Co-Registration

Jyun-Ping Jhan, Jiann-Yeou Rau
National Cheng Kung University, Taiwan

IWIDF-01: Land Use and Land Cover

Time: Monday, 10/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 4
Session Chair: Xinlian Liang
Session Chair: He Zhang

Study of River Channel Migration and Identification of Potential Sugarcane Cultivation Area in the Mohana-Macheli Watershed using Remote Sensing

Dinesh Neupane[1], Pradeep Gyawali[1], Dinee Tamang[2]
[1]Kathmandu University, Nepal; [2]Mercy Corps Nepal

A Land Cover Change Detection Method Based on Difference Map Fusion

Huaqiao Xing[1], Dongyang Hou[2], Miao Lu[3], Jiage chen[1]
[1]School of Surveying and Geo-informatics, Shandong Jianzhu University, Jinan 250101, China; [2]School of Geosciences and Info Physics, Central South University, Changsha 410083, China; [3]Key Laboratory of Agri-informatics, Ministry of Agriculture/Institute of Agricultural Resources and Regional Planning, Chinese Academy of Agricultural Sciences, Beijing, China

UAV/Satellite Multiscale Data Fusion for Crop Monitoring and Early Stress Detection

Vasit Sagan[1], Maitiniyazi Maimaitijiang[1], Paheding Sidike[1], Matthew Maimaitiyiming[1], Hasanjan Erkbol[1], Sean Hartling[1], Kyle T. Peterson[1], Jim Peterson[2], Joel G. Burken[3], Felix B. Fritschi[4]
[1]Saint Louis University, United States of America; [2]Missouri State University; [3]Missouri University of Science and Technology; [4]University of Missouri

SEM-02: Deep Learning from Terrestrial Data

Time: Monday, 10/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 2
Session Chair: Bruno Vallet
Session Chair: Martin Weinmann

Using 3D Models to Generate Labels for Panoptic Segmentation of Industrial Scenes

Adrien Nivaggioli[1], Jean-Francois Hullo[1], Guillaume Thibault[2]
[1]EDF Energy R&D UK Centre, United Kingdom; [2]EDF R&D, France

Floodwater Level Estimation from Social Media Images

Priyanka Chaudhary[1], Dr. Stefano D'Aronco[1], Matthew Moy de Vitry[2], Dr. Joao Paulo Leitao[2], Dr. Jan Dirk Wegner[1]
[1]ETH Zurich, Switzerland; [2]Eawag - Swiss Federal Institute of Aquatic Science and Technology

Comparison of Training Strategies for ConvNets on Multiple Similar Datasets for Facade Segmentation

Matthias Schmitz, Hai Huang, Helmut Mayer
Bundeswehr University Munich, Germany

UAVG-02a: UAV Photogrammetry I

Time: Monday, 10/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 3
Session Chair: Costas Armenakis
Session Chair: Ewelina Rupnik

Investigations into the Quality of Image-Based Point Clouds from UAV Imagery

Heinz-Jürgen Przybilla[1], Maren Lindstaedt[2], Thomas P. Kersten[2]
[1]Lab for Photogrammetry, Bochum University of Applied Sciences, Germany; [2]Photogrammetry & Laser Scanning Lab, HafenCity Universität Hamburg, Germany

Comparison of UAV Imagery-Derived Point Cloud to Terrestrial Laser Point Cloud

Scott M Peterson, Jacob D Lopez, Riadh Munjy
California State University, Fresno, United States of America

A System for Monitoring of UAV Camera Orientation: Design and Initial Analysis

Jernej Tekavec, Krištof Oštir, Anka Lisec, Gašper Štebe
University of Ljubljana, Faculty of Civil and Geodetic Engineering, Slovenia

UAVG-02b: Precision Farming with UAVs I

Time: Monday, 10/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 1
Session Chair: Arko Lucieer
Session Chair: Matthew McCabe

Automatic Generation of Geometric Parameters of Individual Cauliflower Plants for Rapid Phenotyping Using Drone Images

Görres Grenzdörffer
University of Rostock, Germany

Predicting Biomass and Yield at Harvest of Salt-Stressed Tomato Plants Using UAV Imagery

Kasper Johansen[1], Mitchell Morton[1], Yoann Malbeteau[1], Bruno Aragon[1], Samir Al-Mashharawi[1], Matteo Ziliani[1], Yoseline Angel[1], Gabriele Fiene[1], Sónia Negrão[2], Magdi Mousa[3], Mark Tester[1], Matthew McCabe[1]
[1]King Abdullah University of Science and Technology, Saudi Arabia; [2]University College Dublin, Ireland; [3]King Abdulaziz University, Saudi Arabia

High Throughput Phenotyping of Physiological Growth Dynamics from UAS-Based 3D Modeling in Soybean

Monica Herrero-Huerta, Katy M. Rainey
Purdue University, United States of America

IWIDF-02: Applications of Multi-Source Data Fusion

Time: Monday, 10/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 4
Session Chair: Wei Yao
Session Chair: He Zhang

Iterative Closest Point Algorithm for Accurate Registration of Coarsely Registered Point Clouds with CityGML Models

Steffen Goebbels, Regina Pohle-Fröhlich, Philipp Pricken
Niederrhein University of Applied Sciences, Germany

Slope Failure Risk Assessment Modeling Using Topographic Data and Numerical Calculation of Soil Conservation by Tree Root Systems

Taiki Mori[1], Tomoyasu Sugiyama[2], Ikuya Hosooka[1], Makoto Nakata[3], Kazuyuki Okano[4], Yoshifumi Satofuka[5]
[1]Structural Engineering Office / West Japan Railway Company; [2]Graduate School of Engineering / Kyoto University; [3]National Land Conservation Technical Dept / Asia Air Survey CO., LTD; [4]Nishi-Nihon National Land Conservation Consulting Dept, Asia Air Survey CO., LTD; [5]College of Scienc and Engineering / Ritsumeikan University

Introducing A Framework for Conflating Road Network Data with Semantic Web Technologies

Michael G. Niestroj, David A. McMeekin, Petra Helmholz
Curtin University, Australia

Analyzing The Effect of Climate Change (Rainfall ond Temperature) on Vegetation Cover of Nepal Using Time Series Modis Images

Neha Joshi[1], Pradeep Gyawali[1], Sudha Sapkota[1], Dinesh Neupane[1], Sanjeevan Shrestha[2], Florencia Matina Tuladhar[1], Nawaraj Shrestha[1]
[1]Kathmandu University, Nepal; [2]Land Management Training Centre, Government of Nepal

Study on Snowmelt Flood Disaster Model based on Remote Sensing and GIS

Chen Qiao[1], Quanyi Huang[1], Tao Chen[1], Yiming Chen[2]
[1]Department of Earth System Science, Tsinghua University, Beijing 100084, China; [2]Chinese Academy of Surveying & Mapping, Beijing 100036, China

SEM-03: Classification for Topographic Applications

Time: Monday, 10/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 2
Session Chair: Uwe M. Stilla
Session Chair: Yuliang Lan

Multispectral Airborne Laser Scanning Point-Clouds for Land Cover Classification Using Convolutional Neural Networks

Lingfei MA[1], Zhuo Chen[1], Ying Li[1], Dedong Zhang[1], Jonathan Li[1,2,3], Michael Chapman[4]
[1]Department of Geography and Environmental Management, University of Waterloo, Waterloo, ON N2L 3G1, Canada; [2]Department of Systems Design Engineering, University of Waterloo, Waterloo, ON N2L 3G1, Canada; [3]Fujian Key Laboratory of Sensing and Computing for Smart Cities, School of Information Science and Engineering, Xiamen University, Xiamen, Fujian 361005, China; [4]Department of Civil Engineering, Ryerson University, Toronto, ON M5B 2K3, Canada

Submanifold Sparse Convolutional Networks for Semantic Segmentation of Large-Scale ALS Point Clouds

Stefan Schmohl, Uwe Sörgel
Universität Stuttgart, Germany

Towards Better Classification of Land Cover and Land Use Based on Convolutional Neural Networks

Chun Yang, Franz Rottensteiner, Christian Heipke
Leibniz University of Hanover, Germany

Building Segmentation from Aerial VHR Images using Mask R-CNN

Kaixuan Zhou[1], Yizi Chen[2], Ihor Smal[1], Roderik Lindenbergh[1]
[1]Dept of Geoscience and Remote Sensing, Delft University of Technology, the Netherlands; [2]Dept of Computational Science and Engineering, Delft University of Technology, the Netherlands

UAVG-03a: UAV Lidar and SAR: Uses and Best Practices

Time: Monday, 10/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 1
Session Chair: Sander Oude Elberink
Session Chair: Eija Honkavaara

Valuing Forest Stand at A Glance with UAV Based Lidar

Udaya Vepakomma, Denis Cormier
FPInnovations, Canada

Airborne to UAS Lidar: An Analysis of UAS Lidar Ground Control Targets

Lesley Davidson[1], Jon Mills[1], Ian Haynes[2], Charles Augarde[3], Paul Bryan[4], Mark Douglas[5]
[1]Newcastle University, School of Engineering; [2]Newcastle University, School of History, Classics and Archaeology; [3]Durham University, Department of Engineering; [4]Historic England; [5]English Heritage

R&D of Drone-Borne SAR System

Tomonori Deguchi, Tomoyuki Sugiyama, Munemaru Kishimoto
Nittetsu Mining Consultants Co., Ltd, Japan

Real-Time Powerline Corridor Inspection by Edge Computing of UAV Lidar Data

Shi Pu[1], Longguang Xie[2], Mingru Ji[1], Yongyi Zhao[1], Wensong Liu[2], Lei Wang[2], Yongqiang Zhao[2], Fang Yang[2], Dan Qiu[2]
[1]Tovos Tech, China, People's Republic of; [2]Guangdong Power Grid Co., Ltd, Guangzhou, China

Comparison of UAV Lidar and Imagery for Beach Monitoring

Lachlan Shaw[1,2], Petra Helmholz[1], David Belton[1], Nicholas Addy[2]
[1]Spatial Sciences, Curtin University, GPO Box U1987, Perth WA 6845, Australia; [2]Land Surveys, 19 Brennan Way, Belmont WA 6104, Australia

UAVG-03b: UAV Flight Planning and Navigation

Time: Monday, 10/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 3
Session Chair: Filiberto Chiabrando
Session Chair: Dorota Iwaszczuk

Flight-Planning for the Calibration of "Prosumer" UAV Cameras

Chris Radford, George Bevan
Queen's University, Canada

Efficient Flight Planning for Building Façade 3D Reconstruction

Harinish Kumar Palanirajan[1], Bashar Saleem Abbas Alsadik[2], Francesco Nex[1], Sander Oude Elberink[1]
[1]Faculty of Geoinformation science and Earth observation (ITC), University of Twente, Netherlands; [2]Cyclomedia, Netherlands

UPhO and MAGO: Two Useful Instruments in Support of Photogrammetric UAV Survey

Sara Gagliolo, Daniele Passoni, Bianca Federici, Ilaria Ferrando, Domenico Sguerso
Università degli studi di Genova, Italy

Mosaicing Fidelity Geometrical Assessment Based on SURF Point Classification

Roberto Giudici, Luc Courtrai, Sebastien Lefevre
Universite Bretagne Sud - IRISA, France

Assessment of Influence of Image Processing on Fully Automatic UAV Photogrammetry

Chenyang Feng[1], Dapeng Yu[2], Yubin Liang[1], Dongxu Guo[1], Qiang Wang[1], Xiaoliang Cui[2]
[1]Tianjin Normal University, China, People's Republic of; [2]Shen Kan Engineering & Technology Corporation, MCC, China, People's Republic of

IND-01: Indoor Mapping I

Time: Tuesday, 11/Jun/2019: 9:00am - 10:30am · *Location:* Waaier 4
Session Chair: Zhizhong Kang
Session Chair: Stephan Nebiker

Vision-based indoor localization via a visual SLAM approach

Minglei Li[1,2], Franz Rottensteiner[2]
[1]College of Electronic and Information Engineering, Nanjing University of Aeronautics and Astronautics, China; [2]Institute of Photogrammetry and GeoInformation, Leibniz Universität Hannover, Germany

Portable Image-Based High Performance Mobile Mapping System in Underground Environments – System Configuration and Performance Evaluation

Stefan Blaser, Stephan Nebiker, Dominik Wisler
Institute of Geomatics, FHNW University of Applied Sciences and Arts Northwestern Switzerland, Muttenz, Switzerland.

Configuration and Simulation Tool for 360-Degree Stereo Camera Rig

Oliver Hasler[1], Benjamin Loesch[2], Stefan Blaser[1], Stephan Nebiker[1]
[1]Institute of Geomatics Engineering, FHNW University of Applied Sciences and Arts Northwestern Switzerland, Switzerland; [2]iNovitas, Baden-Dättwil, Switzerland

Quantifying the Quality of Indoor Maps

Moawiah Assali[1], Georgios Pipelidis[2], Vladimir Podolskiy[1], Dorota Iwaszczuk[3], Lukas Heinen[4], Michael Gerndt[1]
[1]Computer Architecture and Parallel Systems, Technical University of Munich, Germany; [2]Software and Systems Engineering Research Group, Technical University of Munich, Germany; [3]Computational Modeling and Simulation, Technical University of Munich, Germany; [4]BMW Group IT, Munich, Germany

A Graph-Matching Approach to Indoor Localization Using a Mobile Device and a Reference Building Information Model (BIM)

Fanny Bot, Pirouz Nourian, Edward Verbree
Delft University of Technology, the Netherlands

JS-01: Semantic Analysis of UAV and Oblique Aerial Images

Time: Tuesday, 11/Jun/2019: 9:00am - 10:30am · *Location:* Waaier 1+2
Session Chair: Franz Rottensteiner
Session Chair: Petra Helmholz

Keynote: Vision-based Robotic Perception

Margarita Chli
ETH Zürich, Switzerland

Automatic Muck Pile Characterization from UAV Images

Fabian Schenk[1], Alexander Tscharf[2], Gerhard Mayer[2], Friedrich Fraundorfer[1]
[1]Graz University of Technology, Austria; [2]Montanuniversitaet Leoben

Vector Map generation from Aerial Imagery using Deep Learning

Manish Sahu[1], Anurag Ohri[2]
[1]Indshine, India; [2]Indian Institute of Technology (BHU), Varanasi

Damage Detection on Building Façades Using Multi-Temporal Aerial Oblique Imagery

Diogo Duarte, Francesco Nex, Norman Kerle, George Vosselman
University of Twente, Faculty ITC, the Netherlands

JS-02: Building Models

Time: Tuesday, 11/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 1
Session Chair: Zhizhong Kang
Session Chair: Uwe Soergel

Keynote: Fast, Automated 3D Modeling of Building Interiors and Parsing of Assets

Avideh Zakhor
UC Berkeley, United States of America

A Stochastic Approach to Automated Reconstruction of 3D Models of Interior Spaces from Point Clouds

Ha Tran, Kourosh Khoshelham
Department of Infrastructure Engineering, The University of Melbourne, Parkville 3010, Australia

Indoor 3D Modeling and Flexible Space Subdivision from Point Clouds

Shayan Nikoohemat[1], Abdoulaye Diakité[2], Sisi Zlatanova[2], George Vosselman[1]
[1]University of Twente, Faculty ITC, the Netherlands; [2]Dept. of Built Environment, University of New South Wales, Sydney, Australia

Semantic Segmentation of Building in Airborne Images

Shan Huang, Francesco Nex, Yaping Lin, Michael Ying Yang
University of Twente, Netherlands

UAVG-04a: Towards Autonomous Navigation

Time: Tuesday, 11/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 4
Session Chair: Davide Antonio Cucci
Session Chair: Fabio Remondino

Application of Self-Organizing Map on Flight Data Analysis for Quadcopter Health Diagnosis System

De-Li Cheng, Wei.Hsiang Lai
National Cheng-Kung University, Taiwan

Improved Reference Key Frame Algorithm

Haytham Mohamed[1], Adel Moussa[1,2], Mohamed Elhabiby[3], Naser El-Sheimy[1]
[1]University of Calgary, Canada; [2]Port-Said University, Port-Said, Egypt; [3]Ain Shams University, Cairo, Egypt

Enhanced UAV Navigation Using Hall-Magnetic and Air-Mass Flow Sensors In Indoor Environment

Shady Zahran[1], Adel Moussa[1,2], Naser El-Sheimy[1]
[1]University of Calgary, Canada; [2]Port said University, Egypt

Autonomous UAV-Based 3D-Reconstruction of Structures for Aerial Physical Interaction

Beril Sirmacek, Ramy Rashad, Patrick Radl
University of Twente, Netherlands, The

UAVs Enhanced Navigation in Outdoor GNSS Denied Environment Using UWB and Monocular Camera Systems

Shady Zahran[1], Andrea Masiero[2], Mostafa Mostafa[1], Adel Moussa[1,3], Antonio Vettore[2], Naser El-Sheimy[1]
[1]University of Calgary, Canada; [2]University of padua, italy; [3]Port Said University, Egypt

UAVG-04b: Environmental Monitoring

Time: Tuesday, 11/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 2
Session Chair: Görres Grenzdörffer
Session Chair: Caroline Gevaert

Raspberry PI 3 Multispectral Low-Cost Sensor for UAV Based Remote Sensing. Case Study in South-West Niger

Elena Belcore[1,2], Marco Piras[1], Alessandro Pezzoli[2], Giovanni Massazza[2], Maurizio Rosso[1]
[1]Politecnico di Torino, DIATI, Department of Environment, Land and Infrastructure Engineering, Italy; [2]Politecnico di Torino, DIST, Interuniversity Department of Regional and Urban Studies and Planning, Italy

Preliminary Evaluation of Atmospheric Temperature and Wind Profiles Obtained Using Unmanned Aerial Vehicle Based Acoustic Tomography

Anthony Finn, Kevin Rogers, Joshua Meade, Jarrod Skinner, Amir Zargarian
University of South Australia, Australia

Detecting Antarctic Seals and Flying Seabirds by UAV

Osama Mustafa[1], Christina Braun[2], Jan Esefeld[1,2], Stefan Knetsch[1], Jakob Maercker[1], Christian Pfeifer[1], Marie-Charlott Rümmler[1]
[1]ThINK - Thuringian Institute of Sustainability and Climate Protection, Germany; [2]Institute of Ecology and Evolution, Friedrich Schiller University Jena, Dornburger Straße 159, 07743 Jena, Germany

Intraseasonal Variability of Guano Stains in A Remotely Sensed Penguin Colony Using UAV and Satellite Images

Maximilian Firla[1], Osama Mustafa[1], Christian Pfeifer[1], Martin Senf[2], Sören Hese[3]
[1]ThINK - Thuringian Institute of Sustainability and Climate Protection, Germany; [2]Institute of Ecology and Evolution, Friedrich Schiller University Jena, Germany; [3]Institute for Geoinformatics, Friedrich Schiller University Jena, Germany

Mass Movement of an Alpine Rock Glacier

Ruedi Boesch, Christoph Graf
Swiss Federal Institute for Forest, Snow and Landscape Research WSL, Switzerland

IS-02: Gold sponsor presentations: nFrames and Geodyn

Time: Tuesday, 11/Jun/2019: 1:15pm - 2:15pm · *Location:* Waaier 2
Session Chair: Michael Ying Yang

1:15pm - 1:45pm

Precision aware 3D Mesh reconstruction from imagery and LiDAR with SURE

Konrad Wenzel
nFrames, Germany

1:45pm - 2:15pm

Access and Processing of Time-Phased Aerial Photography

Rolf Becker
GeoDyn, Germany

PS-02: Poster session

Time: Tuesday, 11/Jun/2019: 1:30pm - 2:30pm · *Location:* Foyer

Fully Convolutional Networks for Street Furniture Identification in Panorama Images

Ying Ao[1], Jinhu Wang[2], Mei Zhou[2], Roderik Lindenbergh[3], Michael Ying Yang[1]

[1]University of Twente, Netherlands; [2]Academy of Opto-Electronics, Chinese Academy of Sciences, China; [3]TU Delft, Netherlands

Cloud-based Solution for Nationwide Power Line Mapping

Isabella Toschi[1], D. Morabito[1,4], E. Grilli[1], Fabio Remondino[1], C. Carlevaro[2], A. Cappellotto[2], G. Tamagni[3], M. Maffeis[3]

[1]3D Optical Metrology (3DOM) unit, Bruno Kessler Foundation (FBK), Trento, Italy; [2]Spindox Labs srl, Trento, Italy; [3]Enel Group – Europa e Latino America, Milano, Italy; [4]Laboratory of Photogrammetry, National Technical University of Athens (NTUA), Athens, Greece

Support Vector Machine and Decision Tree Based Classification of Side-Scan Sonar Mosaics using Textural Features

Hendra Kurnia Febriawan[1,2], Petra Helmholz[1], iain Parnum[3]

[1]Spatial Sciences, Curtin University, GPO Box U1987, Perth, WA, 6845, Australia; [2]Technology Centre for Marine Survey, Agency for Assessment and Application of Technology (BPPT), Jakarta, 10340, Indonesia; [3]Centre for Marine Science and Technology, Curtin University, GPO Box U1987, Perth, WA, 6845, Australia

Marked Point Processes for the Automatic Detection of Bomb Craters in Aerial Wartime Images

Christian Kruse, Franz Rottensteiner, Christian Heipke

Institute of Photogrammetry and GeoInformation, Leibniz Universität Hannover, Germany

A Modified Three-Dimensional Gray-Level Co-Occurrence Matrix for Image Classification with Digital Surface Model

Yan Li, Wang Xia

Wuhan University, China, People's Republic of

A Faster R-CNN Approach for Extracting Indoor Navigation Graph from Building Designs

Lei Niu, Yiquan Song

Henan University of Urban Construction, China, People's Republic of

A Comparison of Three Methods for Individual Tree Crown Segmentation of Digital Surface Models From 3K Optical Imagery

Christian Kempf[1,2], Jiaojiao Tian[2], Franz Kurz[2], Pablo d'Angelo[2], Peter Reinartz[2]

[1]TUM, Germany; [2]DLR, Germany

A Book Retrieval and Location System based on Real-Scene 3D

Shuangfeng Wei[1,2,3,4], Boyi Li[1], Zhihao Guo[1], Shuai Guo[1], Liurun Cheng[1]

[1]School of Geomatics and Urban Spatial Informatics, Beijing University of Civil Engineering and Architecture, Beijing; [2]Engineering Research Center of Representative Building and Architectural Heritage database, Ministry of Education, Beijing; [3]Key Laboratory for Urban Geomatics of Ministry of Natural Resources, Beijing; [4]Beijing Key Laboratory for Architectural Heritage Fine Reconstruction & Health Monitoring, Beijing

Placement Optimization of Positioning Nodes: Maximizing the distinction of Indoor Zones

Dimitris Xenakis, Martijn Meijers, Edward Verbree

Delft University of Technology, Netherlands, The

A Comparative Analysis of Planetscope and Sentinel 2 Space-Borne Sensors in Mapping Striga Weed using Guided Regularised Random Forest Classification Ensemble

Bester Tawona Mudereri[1,2], Timothy Dube[2], Elfatih Mohamed Abdel-Rahman[1,3], Saliou Niassy[1], Emily Kimathi[1], Zeyaur Khan[1], Tobias Landman[4]

[1]International Centre of Insect Physiology and Ecology (ICIPE), Kenya; [2]Department of Earth Sciences, University of Western Cape, South Africa; [3]Department of Agronomy, University of Khartoum, Sudan; [4]Remote Sensing Solutions, Germany

CA Markov Modeling of Dynamics of Land Use Land Cover and Sensitivity Analysis to Identify Sensitive Parameter(s)

Md. Surabuddin Mondal[1], Nayan Sharma[2], Martin Kappas[3], P K Garg[4]

[1]Dept. of W R D & M, Indian Institute of Technology, Roorkee – 247667, India; [2]Dept. of W R D & M, Indian Institute of Technology, Roorkee – 247667, India; [3]Dept. of Cartography, GIS & Remote Sensing, Institute of Geography, Georg-August

University, Gottingen, Germany; [4]Dept. of Civil (Geomatics) Engineering, Indian Institute of Technology, Roorkee – 247667, India

A Framework for Estimating Representative Area of a Ground Sample Using Remote Sensing

Prasad Jayant Deshpande, Anudeep Sure, Onkar Dikshit, Shivam Tripathi
Indian Institute of Technology Kanpur, India

An Advanced Benchmarking for Image Compositing Evaluation

Roberto Giudici, Luc Courtrai, Sebastien Lefevre
Universite Bretagne Sud - IRISA, France

Analysis of Bundle Adjustments and Epipolar Model Accuracy According to Flight Path Characteristics of UAV

Jonghwan Son, Pyung-Chae Lim, Junghoon Seo, Taejung Kim
Inha University, Korea, Republic of (South Korea)

Analysis of Orientation Accuracy of an UAV Image According to Camera Calibration

Pyung-Chae Lim, Junghoon Seo, Jonghwan Son, Taejung Kim
Inha University, Korea, Republic of (South Korea)

Development of Visible GPS Simulation Method under Urban Canyon Environment

Dusik Kim[1], Junhee Youn[1], Taehoon Kim[1], Gihong Kim[2]
[1]Korea Institute of Civil Engineering and Building Technology (KICT), Korea, Republic of (South Korea); [2]Gangneung-Wonju National University, Korea, Republic of (South Korea)

Establishing New Foundations for The Use of Remotely-Piloted Aircraft Systems for Civilian Applications

Marco Balsi[1], Sam Prem[2], Koen Williame[3], Dimitri Teboul[4], Laurent Deletraz[5], Pierre Inti Hebrard Capdeville[6]
[1]La Sapienza University, Rome, Italy; [2]Viasat, Lausanne, Switzerland; [3]Unifly, Antwerp, Belgium; [4]Connectiv-IT, Paris, France; [5]Skyguide, Geneve, Switzerland; [6]M3 Systems, Toulouse, France

First Approach to UAV-Based Contact Inspection: A Smart Payload for Navigation in the Neighbourhood of Structures

L. M. González-de Santos[1], J. Martínez-Sánchez[1], H. González-Jorge[2], A. Novo[1], P. Arias[1]
[1]Applied Geotechnologies Group, Dept. Natural Resources and Environmental Engineering, School of Mining and Energy Engineering, University of Vigo, Campus Lagoas-Marcosende, CP 36310 Vigo, Spain; [2]Applied Geotechnologies Group, Dept. Natural Resources and Environmental Engineering, School of Aerospace Engineering, University of Vigo, Campus Lagoas, CP 32004 Ourense, Spain.

Improving Point Cloud Quality Using Multi-Directional Image of UAV

Jihun Kang, Sewon Lee, Sunghyun Yeon
Korea Land and Geospatial Informatix Corp., Korea, Republic of (South Korea)

Potential of Non-Calibrated UAV-Based RGB Imagery for Forage Monitoring: Case Study at the Rengen Long-Term Grassland Experiment (RGE), Germany

Georg Bareth[1], Ulrike Lussem[1], Jannis Menne[1], Jens Hollberg[2], Jürgen Schellberg[2]
[1]University of Cologne, Institute of Geography, GIS & RS Group, Germany; [2]Bonn University, INRES, Germany

Remote Sensing UAV/Drone Technology as a Tool for Urban Development Measures in APCRDA

PREETHILATHA THALATHOTI, NAGASUNDARI K, SREEDHAR CHERUKURI, PRASAD M V V S V
ANDHRA PRADESH CAPITAL REGION DEVELOPMENT AUTHORITY,VIJAYAWADA,India

UAV and LiDAR Image Registration: A Surf-Based Approach for Ground Control Points Selection

Bahareh Kalantar[1], Naonori Ueda[1], Husam Al-Najjar[2], Hossein Moayedi[3], Alfian Halin[4], Shattri Mansor[5]
[1]RIKEN Center for Advanced Intelligence Project, Goal-Oriented Technology Research Group, Disaster Resilience Science Team, Tokyo 103-0027, Japan-; [2]Centre for Advanced Modelling and Geospatial Information Systems (CAMGIS), Faculty of Engineering and IT, University of Technology Sydney, 2007 NSW, Australia.; [3]Dept. of Geotechnics and Transportation, Faculty of Civil Engineering, Universiti Teknologi Malaysia, Skudai, Johor, Malaysia.; [4]Dept. of Multimedia, Faculty of Computer Science and Information Technology, Universiti Putra Malaysia, Serdang 43400, Selangor, Malaysia.; [5]Dept. of Civil Engineering, Faculty of Engineering, Universiti Putra Malaysia, Serdang 43400, Selangor, Malaysia

UAV-based Oblique Photogrammetry for 3D Reconstruction of Transmission Line: Practices and Applications

San Jiang[1], **Wanshou Jiang**[2,3]
[1]School of Computer Science, China University of Geosciences, Wuhan 430074, China; [2]State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, Wuhan 430072, China; [3]Collaborative Innovation Center of Geospatial Technology, Wuhan University, Wuhan, 430072, China

Vertical Orientation Correction of UAV Image-based Point Clouds using Statistical Modeling of Gable Roof Geometry

Przemyslaw Polewski, **Wei Yao**, **Li Fang**
The Hong Kong Polytechnic University, Hong Kong S.A.R. (China)

IND-02: Positioning and Navigation I

Time: Tuesday, 11/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 3
Session Chair: Kourosh Khoshelham
Session Chair: Cheng Wang

Modelling Uncertainty of Single Image Indoor Localisation Using A 3D Model and Deep Learning

Debaditya Acharya[1], Sesa Singha Roy[2], Kourosh Khoshelham[1], Stephan Winter[1]
[1]Department of Infrastructure Engineering, The University of Melbourne, Parkville, Victoria, Australia, 3010; [2]Institute for Sustainable Industries and Livable Cities, Victoria University, Werribee, Victoria, Australia, 3030

A Scene-Assisted Point-Line Feature Based Visual Slam Method for Autonomous Flight in Unknown Indoor Environments

Sai Cheng, Juntao Yang, Zhizhong Kang, Perpetual Hope Akwensi
China university of Geoscience, China, People's Republic of

Navigation in Indoor Voxel Models

Ben Gorte[1], Sisi Zlatanova[1], Fodil Fadli[2]
[1]GRID-UNSW, Australia; [2]Architecture and Urban Planning (DAUP), College of Engineering, Qatar University

IWIDF-03: Deep Learning and Remote Sensing Data Analysis

Time: Tuesday, 11/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 4
Session Chair: Wei Yao

Superpixel Classification of High Spatial Resolution Remote Sensing Image Based on Multi-Scale CNN and Scale Parameter Estimation

Yangyang Chen, Dongping Ming
China University of Geosciences (Beijing)

A Machine Learning Dataset for Large-scope High Resolution Remote Sensing Image Interpretation Considering Landscape Spatial Heterogeneity

Yue XU[1], Xiangyun HU[1], Yujun WEI[1], Ying YANG[2], Donghua WANG[2]
[1]Wuhan University, China, People's Republic of; [2]National Geomatics Center of China, China, People's Republic of

Closing IWIDF

Wei Yao
The Hong Kong Polytechnic University

SEM-04: Building Models and Facades

Time: Tuesday, 11/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 1
Session Chair: Markus Gerke
Session Chair: Jie Shan

Facade Reconstruction for Textured LoD2 CityGML Models Based on Deep Learning and Mixed Integer Linear Programming

Simon Hensel[1], **Steffen Goebbels**[1], **Martin Kada**[2]
[1]Institute for Pattern Recognition, Niederrhein University of Applied Sciences, Krefeld, Germany; [2]Institute of Geodesy and Geoinformation Science, Technical University of Berlin, Berlin, Germany

Unsupervised Window Extraction from Photogrammetric Point Clouds with Thermal Attributes

Dong Lin[1], **Zhen Dong**[2], **Xinlong Zhang**[1], **Hans-Gerd Maas**[1]
[1]Technische Universität Dresden, Institute of Photogrammetry and Remote Sensing, Germany; [2]State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, China

Classification of Aerial Point Clouds with Deep Learning

Emre Özdemir, **Fabio Remondino**
FBK Trento, Italy

UAVG-05a: UAV in Photogrammetry and Education

Time: Tuesday, 11/Jun/2019: 2:30pm - 3:30pm · *Location:* Carré 2K
Session Chair: Costas Armenakis
Session Chair: Taejung Kim

Using DJI Phantom 4 RTK Drone for Topographic Mapping of Coastal Areas

Yuri Taddia[1], Francesco Stecchi[2], Alberto Pellegrinelli[1]
[1]University of Ferrara - Engineering Department, Italy; [2]AdriaRilievi, Italy

Red Tape in Higher Education Institutions: UAV Policy

Patricia K. Freeman, Robert S. Freeland
The University of Tennessee, United States of America

RPAS in The Support of Photogrammetry Education: Cases of Topographic Mapping and Documentation of Historical Monuments

Mario Luiz Lopes Reiss[1], Tatiana Sussel Gonçalves Mendes[4], Márcio Roberto Magalhães de Andrade[5], Alexandre De Morais Amory[3], Roosevelt De Lara[2], Sérgio Florêncio De Souza[2]
[1]LAFOTO – Laboratory of Photogrammetry Research, Department of Geodesy, Institute of Geoscience, UFRGS – Federal University of Rio Grande do Sul, Brazil; [2]LAGEO – Laboratory of Geodesy, Department of Geodesy, Institute of Geoscience, UFRGS – Federal University of Rio Grande do Sul, Brazil; [3]Faculty of Computer Science, PUCRS – Pontifical Catholic University of Rio Grande do Sul, Brazil; [4]Department of Environmental Engineering, Institute of Science and Technology – ICT, University of São Paulo – UNESP, São José dos Campos, São Paulo, Brazil; [5]National Center for Natural Disaster Monitoring and Alerts - CEMADEN, São José dos Campos, São Paulo, Brazil

UAVG-05b: UAV in Agriculture and Forestry II

Time: Tuesday, 11/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 2
Session Chair: Eija Honkavaara
Session Chair: Arko Lucieer

Quantifying Lodging Percentage, Lodging Development and Lodging Severity Using a UAV Based Canopy Height Model

Norman Wilke[1], Bastian Siegmann[1], Onno Muller[1], Lasse Klingbeil[2], Uwe Rascher[1]
[1]Institute of Bio- and Geosciences, Plant Sciences (IBG-2), Research Center Jülich GmbH, 52428 Jülich, Germany;
[2]Department of Geodesy, University of Bonn, 53115 Bonn, Germany

Determining Morphometric Properties of Radiata Pine using Long Wave Infrared Sensing and Biologically-Inspired Vision

Anthony Finn, Russell Brinkworth, Daniel Griffiths, Stefan Peters
University of South Australia, Australia

Intensity-Based Individual Tree Detection from UAV Lidar Data in a Mixed Species Woodland

Aleksandra Zaforemska, Wen Xiao, Rachel Gaulton
School of Engineering, Newcastle University, United Kingdom

IND-03: Indoor Scene Understanding

Time: Tuesday, 11/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 2
Session Chair: Jonathan Li
Session Chair: Sisi Zlatanova

Energy Function Algorithm for Detection of Openings in Indoor Point Clouds

Rami Assi, Tania Landes, Hélène Macher, Pierre Grussenmeyer
ICube Laboratory UMR 7357, Photogrammetry and Geomatics Group, National Institute of Applied Sciences (INSA) Strasbourg, France

Construction of Obstacle Element Map Based on Indoor Scene Recognition

Fuda Li, Hui Wang, Perpetual Hope Akwensi, Zhizhong Kang
China University of Geosciences (Beijing), China, People's Republic of

Semantic Segmentation of Indoor 3D Point Cloud with SLENet

Youli Ding[1], Xianwei Zheng[1], Hanjiang Xiong[1], Yi Zhang[2]
[1]State Key laboratory of Informatioon Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, Hubei, Wuhan; [2]School of Mathematics and Statistics, Wuhan University, Hubei, Wuhan

Using EdgeConv to Improve 3D Object Detection from RGB-D Data

weisheng lin[1], yiping chen[1], cheng wang[1], jonathan li[1,2]
[1]Fujian Key Laboratory of Sensing and Computing, School of Informatics, Xiamen University, 422 Siming Road South, Xiamen 361005, China;; [2]Mobile Mapping Lab, Department of Geography and Environmental Management, University of Waterloo, Waterloo, ON N2L 3G1, Canada

SEM-05: Image Sequences and Tracking

Time: Tuesday, 11/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 3
Session Chair: Michael Ying Yang
Session Chair: Siavash Hosseinyalamdary

Confidence-aware Pedestrian Tracking Using a Stereo Camera

Uyen Dao Xuan Nguyen, Franz Rottensteiner, Christian Heipke
Institut für Photogrammetrie und GeoInformation, Leibniz Universität Hannover, Germany

Precise Vehicle Reconstruction for Autonomous Driving Applications

Max Coenen, Franz Rottensteiner, Christian Heipke
Leibniz University Hannover, Germany

Human Detection based on A Sequence of Thermal Images using Deep Learning

Xinran Wang, Siavash Hosseinyalamdary
University of Twente, Netherlands, The

Closing Semantics3D

Franz Rottensteiner
Leibniz University Hannover, Germany

UAVG-06a: Precision Farming with UAVs II

Time: Tuesday, 11/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 1
Session Chair: Görres Grenzdörffer
Session Chair: Matthew McCabe

Detecting Rumex Obtusifolius Weed Plants in Grasslands From UAV RGB Imagery Using Deep Learning

João Valente[1], Marty Doldersum[2], Corinna Roers[3], Lammert Kooistra[4]
[1]Wageningen University & Research, Netherlands, The; [2]Wageningen University & Research, Netherlands, The; [3]Naturschutzzentrum im Kreis Kleve e.V.; [4]Wageningen University & Research, Netherlands, The

Wheat Lodging Assessment using Multispectral UAV Data

Sugandh Chauhan[1], Roshanak Darvishzadeh[1], Yi Lu[1], Daniela Stroppiana[2], Mirco Boschetti[2], Monica Pepe[2], Andrew Nelson[1]
[1]Faculty of Geo-information Science and Earth Observation (ITC), University of Twente, Enschede 7500AE, The Netherlands; [2]CNR-IREA, Institute for Electromagnetic Sensing of the Environment, National Research Council, 20133 Milano, Italy

Assessment of RGB, Multi- and Hyperspectral UAV Remote Sensing for Grass Quantity and Quality Estimation

Raquel Alves de Oliveira[1], Roope Näsi[1], Oiva Niemeläinen[2], Laura Nyholm[3], Katja Alhonoja[4], Jere Kaivosoja[2], Niko Viljanen[1], Teemu Hakala[1], Somayeh Nezami[1], Lauri Markelin[1], Lauri Jauhiainen[2], Eija Honkavaara[1]
[1]National Land Survey of Finland, Finland; [2]Natural Resources Institute Finland, Finland; [3]Valio Oy, Finland; [4]Yara Suomi Oy, Finland

Extraction of Vineyard Macrostructure from Sub-Optimal Sequences of Aerial Imagery

Anthony Finn, Aaron Melville Smith, Russell Brinkworth
University of South Australia, Australia

Can UAV Lidar Derive Vertical Structure of Herbaceous Vegetation on Riverdike?

Naoko Miura[1], Tomoyo F. Koyanagi[2], Shigehiro Yokota[3], Susumu Yamada[4]
[1]The University of Tokyo, Japan; [2]Tokyo Gakugei University; [3]Tokyo City University; [4]Tokyo University of Agriculture

UAVG-06b: UAV for Emergency Response

Time: Tuesday, 11/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 4
Session Chair: Norman Kerle
Session Chair: Daniele Giordan

Landslide Deformation Monitoring by Three-Camera Imaging System

Jiann-Yeou Rau, Jyun-Ping Jhan, Ruli Andaru
National Cheng Kung University, Taiwan

Towards Post-Disaster Debris Identification for Precise Damage and Recovery Assessments from UAV and Satellite Images

Saman Ghaffarian, Norman Kerle
ITC, University of Twente, The Netherlands

UAV Direct Georeferencing Approach in An Emergency Mapping Context. The 2016 Central Italy Earthquake Case Study

Filiberto Chiabrando[1], Fabio Giulio Tonolo[1], Andrea Lingua[2]
[1]Politecnico di Torino - DAD, Italy; [2]Politecnico di Torino - DIATI, Italy

Towards a High-Resolution Drone-Based 3D Mapping Dataset to Optimise Flood Hazard Modelling

Dietmar Backes[1], Guy Schumann[2], Jan Boehm[3], Felix Norman Teferle[1]
[1]University of Luxembourg, Luxembourg; [2]University of Bristol; [3]University College London

Development Of A Geodatabase for Efficient Remote Sensing Data Management in Emergency Scenarios

Ahmed Alamouri, Markus Gerke
Technical University of Braunschweig, Germany

IND-04: Indoor Modelling

Time: Wednesday, 12/Jun/2019: 9:00am - 10:30am · *Location:* Waaier 4
Session Chair: Lucía Díaz Vilariño
Session Chair: Edward Verbree

Building Change Detection Through Comparison of A Lidar Scan With A Building Information Model

Ha Tran, Kourosh Khoshelham
Department of Infrastructure Engineering, The University of Melbourne, Australia

Automatic Extraction of a Navigation Graph intended for IndoorGML from an Indoor Point Cloud

Puck Flikweert[1], Ravi Peters[1], Lucía Díaz-Vilariño[3], Robert Voûte[1,2], Bart Staats[2]
[1]Delft University of Technology, The Netherlands; [2]CGI, The Netherlands; [3]University of Vigo, Spain

Point clouds to Direct Indoor Pedestrian Pathfinding

Jesús Balado, Lucía Díaz-Vilariño, Pedro Arias, Ernesto Frías
University of Vigo, Spain

Improving Automatic Reconstruction of Interior Walls from Point Cloud Data

Eleonora Maset, Luca Magri, Andrea Fusiello
University of Udine, Italy

An original algorithm for BIM generation from indoor survey point clouds

Francesco Capocchiano[1,2], Roberta Ravanelli[1]
[1]Geodesy and Geomatics Division, DICEA - University of Rome “La Sapienza”, Rome, Italy; [2]Sapienza School for Advanced Studies, Rome, Italy

LS-01: Machine & Deep Learning

Time: Wednesday, 12/Jun/2019: 9:00am - 10:30am · *Location:* Waaier 2
Session Chair: Jan Boehm
Session Chair: David Griffiths

PointNet for The Automatic Classification of Aerial Point Clouds

Mario Soilán[1], Roderik Lindenbergh[2], Belén Riveiro[1], Ana Sánchez-Rodríguez[1]
[1]Dept. of Materials Engineering, Applied Mechanics and Construction, University of Vigo, Spain; [2]Dept. of Geoscience and Remote Sensing, TU Delft, The Netherlands

Feature Relevance Analysis for 3D Point Cloud Classification Using Deep Learning

Ashutosh Kumar[1,2], Katharina Anders[3,4], Lukas Winiwarter[3], Bernhard Höfle[3,4]
[1]Institute of Industrial Science, The University of Tokyo, Komaba, Japan; [2]School of Engineering, The University of Tokyo, Hongo, Japan; [3]3D Geospatial Data Processing Research Group (3DGeo), Institute of Geography, Heidelberg University, Heidelberg, Germany; [4]Interdisciplinary Center for Scientific Computing (IWR), Heidelberg University, Heidelberg, Germany

Classification of Aerial Laser Scanning Point Clouds using Machine Learning: A Comparison Between Random Forest and Tensorflow

Francesco Pirotti[1,2], Filippo Tonion[1,2]
[1]CIRGEO Interdepartmental Research Center of Geomatics, University of Padova, Italy; [2]TESAF Department, University of Padova, Italy

Joint Classification of ALS and DIM Point Clouds

Florian Politz, Monika Sester
Leibniz Univerversity Hannover, Institute of Cartography and Geoinformatics, Germany

Extraction and Shape Reconstruction of Guardrails Mobile Mapping Data

Hiroki Matsumoto, Yuma Mori, Hiroshi Masuda
The University of Electro-Communications, Japan

UAVG-07a: Scene Understanding from UAV Data

Time: Wednesday, 12/Jun/2019: 9:00am - 10:30am · *Location:* Waaier 1
Session Chair: Claudio Persello
Session Chair: Ewelina Rupnik

Translating Aerial Images into Street-Map-Like Representations for Visual Self-Localization of UAVs

Michael Schleiss
FKIE Fraunhofer Institute, Germany

Urban Scene Classification Using Features Extrated from Photogrammetric Point Clouds Acquired by UAV

Guilherme Gomes Pessoa[1], Renato Cesar Dos Santos[1], André Caceres Carrilho[1], Maurício Galo[1,2], Amilton Amorim[1,2]
[1]São Paulo State University - UNESP, Graduate Program in Cartographic Sciences, Presidente Prudente, São Paulo, Brazil; [2]São Paulo State University - UNESP, Dept. of Cartography, Presidente Prudente, São Paulo, Brazil

Resnet-Based Tree Species Classification Using UAV Images

Sowmya Natesan[1], Costas Armenakis[1], Udayalakshmi Vepakomma[2]
[1]York University, Canada; [2]FPInnovations, Canada

Surface Flow Velocity Measurements from UAV-Based Videos

Jens Brauneck, Thomas Gattung, Robert Jüpner
Hydraulic Engineering and Water Management, Civil Engineering, TUK Kaiserslautern, Germany – brauneck@rhrk.uni-kl.de

A Real-Time Drone Mapping Platform for Marine Surveillance

Ilseo Jeon[1], Sangwoo Ham[1], Jangwoo Cheon[1], Anna Maria Klimkowska[1], Hwiyoung Kim[1], Kyoungah Choi[2], Impyeong Lee[1]
[1]Dept. of Geoinformatics, University of Seoul, Seoul, Republic of Korea; [2]Innovation Growth Headquaters, Korea Agency for Infrastructure Technology Advancement, Gyeonggi-do, Republic of Korea

UAVG-07b: UAVs in H2020 Projects

Time: Wednesday, 12/Jun/2019: 9:00am - 10:30am · *Location:* Waaier 3
Session Chair: Francesco Nex

AEROBI - AErial RObotic System for In-Depth Bridge Inspection by Contact

Philippe Chrobocinski
Airbus Defence and Space, France

MONIFLY - Mobile Network Infrastructure For Surveillance Of Low Flying

Björn Blom
Technical University Braunschweig, Germany

DroC2om – Drone Critical Communications

Benjamin Hiller
atesio GmbH, Germany

Muse3D - Multi-Spectral- and 3D-Monitoring of Vegetation by UAVs

Konstantinos Smagas
Geoimaging Ltd, Cyprus

ITS4LAND- Innovative Geospatial Tools for Mapping Land Rights

Mila Koeva
University of Twente, Netherlands, The

IND-05: Virtual and Augmented Reality

Time: Wednesday, 12/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 4
Session Chair: Kourosh Khoshelham
Session Chair: Avideh Zakhor

Augmented Annotations: Indoor Dataset Generation with Augmented Reality

Vedant Saran, James Lin, Avideh Zakhor
University of California Berkeley, United States of America

Indoor Mapping Eyewear: Geometric Evaluation of Spatial Mapping Capability of Hololens

Kourosh Khoshelham, Ha Tran, Debaditya Acharya
University of Melbourne, Australia

Indoor 3D Interactive Asset Detection Using a Smartphone

Revekka Kostoeva, Rishi Upadhyah, Yersultan Sapar, Avideh Zakhor
University of California, Berkeley, United States of America

Creation of A Virtual Reality Environment of A University Museum Using 3D Photogrammetric Models

Kayziel Martinez, Marko Zolo Untalan, Diana Faith Burgos, Roseanne Ramos, Mark Jonathan Germentil
University of the Philippines Diliman, Philippines

ISSDQ-01: Spatial Data Quality: The Wider Context

Time: Wednesday, 12/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 3
Session Chair: Alfred Stein
Session Chair: Wenzhong Shi

Keynote: Contextual Uncertainties in Geographic and Environmental Health Research

Mei-Po Kwan
University of Illinois Urbana-Champaign, United States of America

Detection of Shallow Water Area with Machine Learning Algorithms

Nur Yagmur, Nebiye Musaoglu, Gülsen Taskin Kaya
Istanbul Technical University, Turkey

A Synthetic 3D Scene for the Validation of Photogrammetric Algorithms

Dirk Frommholz
DLR - German Aerospace Center, Germany

LS-02: Change Detection

Time: Wednesday, 12/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 2
Session Chair: Wei Yao
Session Chair: Gottfried Mandlburger

Clustering Time Series of Repeated Scan Data of Sandy Beaches

Roderik Lindenbergh, Sylke Van der Kleij, Mieke Kuschnerus, Sander Vos, Sierd de Vries
TU Delft, Netherlands, The

Non-Rigid Multi-Body Tracking in RGBD Streams

KaiXuan Dai[1], Hao Guo[1], Philippos Mordohai[2], Francesco Marinello[3], Andrea Pezzuolo[3], QuanLong Feng[1], QuanDi Niu[1]
[1]China Agricultural University, China, People's Republic of; [2]Department of Computer Science, Stevens Institute of Technology, New Jersey, USA; [3]Department of Land, Environment, Agriculture and Forestry, University of Padova, Italy

High-Frequency 3D Geomorphic Observation using Hourly Terrestrial Laser Scanning Data of a Sandy Beach

Katharina Anders[1,2], Roderik C. Lindenbergh[3], Sander Vos[4], Hubert Mara[2], Sierd de Vries[4], Bernhard Höfle[1,2,5]
[1]3D Geospatial Data Processing Research Group (3DGeo), Institute of Geography, Heidelberg University, Germany; [2]Interdisciplinary Center for Scientific Computing (IWR), Heidelberg University, Germany; [3]Department of Geoscience & Remote Sensing, Delft University of Technology, The Netherlands; [4]Department of Hydraulic Engineering, Delft University of Technology, The Netherlands; [5]Heidelberg Center for the Environment, Heidelberg University, Germany

Assessment of Landslide-Induced Displacement and Deformation of Above-Ground Objects Using UAV-Borne and Airborne Laser Scanning Data

Thomas Zieher[1], Magnus Bremer[1,2], Martin Rutzinger[1,2], Jan Pfeiffer[1,2], Patrick Fritzmann[3], Volker Wichmann[4]
[1]Institute for Interdisciplinary Mountain Research, Austrian Academy of Sciences, Technikerstr. 21a, 6020 Innsbruck, Austria; [2]Institute for Geography, University of Innsbruck, Innrain 52f, 6020 Innsbruck, Austria; [3]Federal state of Tyrol, Division of Geoinformation, Herrengasse 3, 6020 Innsbruck, Austria; [4]Laserdata GmbH, Technikerstr. 21a, 6020 Innsbruck, Austria

Comparison and Time Series Analysis of Landslide Displacement Mapped by Airborne, Terrestrial and Unmanned Aerial Vehicle Based Platforms

Jan Pfeiffer[1,2], Thomas Zieher[1,2], Martin Rutzinger[1,2], Magnus Bremer[1,2], Volker Wichmann[3]
[1]Institute of Interdisciplinary Mountain Research, Austrian Academy of Science, Austria; [2]Institute of Geography, University of Innsbruck, Austria; [3]Laserdata GmbH, Austria

UAVG-08a: Integration of UAV Data with Other Sources

Time: Wednesday, 12/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 1
Session Chair: Norbert Haala
Session Chair: Sander Oude Elberink

Evaluation and Calibration of Fixed-Wing Multisensor UAV Mobile Mapping System: Improved Results

Krzysztof Bakuła[1], Wojciech Ostrowski[1], Magdalena Pilarska[1], Marcin Szender[2], Zdzisław Kurczyński[1]
[1]Warsaw University of Technology, Faculty of Geodesy and Cartography, Warsaw, Poland; [2]MSP Marcin Szender, Warsaw, Poland

Orientation of UAV Image Blocks by Surface Matching

Jose Alberto Gonçalves[1], Nuno Jordão[2], André Pinhal[1]
[1]University of Porto, Science Faculty, Portugal; [2]Academia Militar, Lisbon, Portugal

The Joint Research Project ANKommEn - Exploration Using Automated UAV and UGV

Ahmed Alamouri[1], Markus Gerke[1], Simon Batzdorfer[2], Martin Becker[2], Ulf Bestmann[2], Markus Bobbe[2], Yogesh Khedar[2], Tobias Blume[3], Jan Schattenberg[3], Jolian Schmiemann[3]
[1]Technical University of Braunschweig, Institute for Geodesy and Photogrammetry, Braunschweig, Germany; [2]Technical University of Braunschweig, Institute of Flight Guidance, Braunschweig, Germany; [3]Technical University of Braunschweig, Institute of Mobile Machines and Commercial Vehicles, Braunschweig, Germany

Automatic Co-Registration of Aerial Imagery and Untextured Model Data Utilizing Average Shading Gradients

Sylvia Schmitz[2,1], Martin Weinmann[2], Boitumelo Ruf[1,2]
[1]Fraunhofer Institute of Optronics, System Technologies and Image Exploitation (IOSB), Karlsruhe, Germany; [2]Institute of Photogrammetry and Remote Sensing, Karlsruhe Institute of Technology, Karlsruhe, Germany

360° Images for UAV Multisensor Data Fusion: First Tests and Results

Alessio Calantropio, Filiberto Chiabrando, Davide Einaudi, Lorenzo Teppati Losè
DAD, Department of Architecture and Design – Politecnico di Torino, Viale Pier Andrea Mattioli, 39 – 10125, Torino, Italy

UAVG-08b: ITS4LAND I

Time: Wednesday, 12/Jun/2019: 11:00am - 12:30pm · *Location:* Carré 2K
Session Chair: Mila Koeva

Introduction to the ITS4LAND sessions

Mila Koeva
University of Twente, The Netherlands

ITS4LAND - A Land Administration Toolbox with Innovative Geospatial Tools for Fit-for-Purpose Land Rights Recording

Tarek Zein
Hansa Luftbild

Governance and Capacity Development Model to Support the Implementation of the ITS4LAND Tools

Joep Cromvoets
KU Leuven, Belgium

UAV Data Acquisition for Land Administration

Claudia Stöcker
University of Twente, Netherlands, The

IS-03: Gold sponsor presentations:Riegl and Zoller & Fröhlich

Time: Wednesday, 12/Jun/2019: 1:15pm - 2:15pm · *Location:* Waaier 2
Session Chair: Sander Oude Elberink

1:15pm - 1:45pm

Floor plans and views of a historic building using laser scanning

Nikolaus Studnicka
Riegl, Austria

1:45pm - 2:15pm

Data Acquisition using 3D Laserscanning Technology

Faisal Shahzad
Zoller & Fröhlich

PS-03: Poster session

Time: Wednesday, 12/Jun/2019: 1:30pm - 2:30pm · *Location:* Foyer

Feature Selection of Optical Satellite Images for Chlorophyll-a Concentration Estimation

Manh Van Nguyen[1,2], Hone-Jay Chu[1], Chao-Hung Lin[1], Lalu Muhamad Jaelani[3]
[1]Department of Geomatics, National Cheng Kung University; [2]Vietnam Academy of Science and Technology, Institute of Geography; [3]Institut Teknologi Sepuluh Nopember, Department of Geomatics Engineering

Lithological Mapping Using Landsat 8 OLI and ASTER Multispectral Data in Imini-Ounilla District South High Atlas of Marrakech

Zouhair OURHZIF, Ahmed Algouti, Abdellah Algouti, Fatiha Hadach
University Cadi Ayyad

Analysis of Common Quality Problems in Coordinate Transformation Between Reference Coordinate System and Geocentric Coordinate System

Xunhu Zhang, Jixian Zhang, Lei Zhang, Jinhu Liu
National Quality Inspection and Testing center for Surveying and Mapping product, China, People's Republic of

Weighted Point Cloud Augmentation for Neural Network Training Data Class-Imbalance

David Griffiths, Jan Boehm
University College London, United Kingdom

Semantic Labeling of ALS Point Clouds for Tree Species Mapping Using the Deep Neural Network PointNet++

Sebastian Briechle[1], Peter Krzystek[1], George Vosselman[2]
[1]Munich University of Applied Sciences, Munich, Germany; [2]University of Twente, Faculty ITC, the Netherlands

Evaluating the Possibility of Tree Species Classification with Dual-Wavelength ALS Data

Magdalena Pilarska, Wojciech Ostrowski
Warsaw University of Technology, Faculty of Geodesy and Cartography, Poland

Large scale LiDAR points classification by using active learning

Nan Li[1,2], Norbert Pfeifer[1]
[1]Technische Universität Wien, Austria; [2]Tongji University, China

3D-CNN Based Tree Species Classification Using Mobile LiDAR Data

Haiyan Guan[1], Yongtao Yu[2], Wanqian Yan[1], Yufu Zang[1], Dilong Li[3], Jonathan Li[4]
[1]Nanjing University of Information Science and Technology, China, People's Republic of; [2]Huaiyin Institute of Technology, China, People's Republic of; [3]Wuhan University, China, People's Republic of; [4]University of Waterloo,Canada

Individual Tree Species Classification Based on Terrestrial Laser Scanning Using Curvature Estimation and Convolutional Neural Network

Tomohiro Mizoguchi[1], Akira Ishii[2], Hiroyuki Nakamura[2]
[1]Nihon University; [2]Woodinfo Inc.

Point Cloud Classification by Fusing Supervoxel Segmentation with Multi-Scale Features

Wei Ao[1], Lei Wang[2], Jie Shan[3]
[1]School of Remote Sensing and Information Engineering, Wuhan University, Wuhan, China; [2]State Key Laboratory for Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, China; [3]Lyles School of Civil Engineering, Purdue University, USA

Classification of Mobile Lidar Data Using Vox-Net and Auxiliary Training Samples

Hanxian He, Kourosh Khoshelham, Clive Fraser
The University of Melbourne, Australia

Automatic Classification of Bridges and Continental Water Bodies from 3D Point Clouds (Aerial Lidar)

Sara Lorite Martínez, Jesús Moreno Jabato, Borja Rodríguez Cuenca, Jesús María Garrido Sáenz de Tejada
Spanish National Geographic Institute, Madrid (Spain)

Building Detection from Lidar Data Using Entropy and the K-Means Concept

Renato Cesar Dos Santos[1,2], Guilherme Gomes Pessoa[1,2], André Caceres Carrilho[1,2], Maurício Galo[1,3]
[1]Faculdade de Ciências e Tecnologia/ Universidade Estadual Paulista (FCT/UNESP) - Brazil; [2]Programa de Pós-Graduação em Ciências Cartográficas; [3]Departamento de Cartografia

Automatic Detection of Road Edges from Aerial Laser Scanning Data

Linh Truong-Hong[1], Debra Laefer[2], Roderik Lindenbergh[1]
[1]Dept. of Geoscience and Remote Sensing, Delft University of Technology, Netherlands; [2]Center for Urban Science and Progress, New York University, New York, US

Automatic Road Markings Extraction, Classification and Vectorization from Mobile Laser Scanning Data

Yue Pan[1,2], Bisheng Yang[1], Shengfu Li[3], Hong Yang[3], Zhen Dong[1], Xue Yang[4]
[1]State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, Wuhan, China; [2]School of Geodesy and Geomatics, Wuhan University, Wuhan, China; [3]Sichuan Provincial Transport Department Highway Planning, Survey, Design and Research Institute, Chengdu, China; [4]Faculty of Information Engineering, China university of Geosciences, Wuhan, China

Mobile Laser Scan Data for Road Surface Damage Detection

Bibi van der Horst[1], Roderik Lindenbergh[1], Sander Puister[2]
[1]Department of Geoscience and Remote Sensing, Delft University of Technology, Netherlands; [2]Iv-Infra, Haarlem, Netherlands

Automatic Detection of Forest-Road Distances to Improve Clearing Operations in Road Management

Ana Novo Gómez[1], Higinio González Jorge[2], Joaquín Martínez Sánchez[1], Luis González de Santos[1], Henrique Lorenzo Cimadevila[3]
[1]Geotech Group, Department of Natural Resources and Environmental Engineering, School of Mining Engineering, University of Vigo, 36310, Vigo, Spain; [2]Geotech Group, Department of Natural Resources and Environmental Engineering, School of Aerospace Engineering, University of Vigo, 32004, Ourense, Spain; [3]Geotech Group, Department of Natural Resources and Environmental Engineering, School of Forestry Engineering, University of Vigo, 36005, Pontevedra, Spain

Automatic Detection and Characterisation of Power Lines and Their Surroundings Using LiDAR Data

Miguel Yermo García, Jorge Martínez Sánchez, Oscar García Lorenzo, David López Vilariño, José C. Cabaleiro Domínguez, Tomás Fernández Pena, Francisco Fernández Rivera
CiTIUS, Centro Singular de Investigación en Tecnologías de la Información, Spain

TLS Point Cloud Registration for Detecting Change in Individual Rocks of a Mountain River Bed

Agata Walicka[1,2], Norbert Pfeifer[2], Grzegorz Jóźków[1], Andrzej Borkowski[1]
[1]Wroclaw University of Environmental and Life Sciences, Poland; [2]Vienna University of Technology, Austria

TLS Point Cloud Registration Based on ICP Algorithm Using Point Quality

Hiroaki Date[1], Eisuke Wakisaka[2], Yoshinori Moribe[3], Satoshi Kanai[1]
[1]Hokakido University; [2]Shinryo Corporation; [3]Sanki Engineering Corporation

IND-06: Positioning and Navigation II

Time: Wednesday, 12/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 4
Session Chair: Beril Sirmacek
Session Chair: Kai-Wei Chiang

The automatic generation of an adaptive navigation model for indoor map matcing

Pengyuan Wang[1,2], Jianga Shang[1,2], Zhiyong Zhou[3], Yijie Wu[1,2], Weixin Sun[4]
[1]Faculty of Information Engineering, China University of Geosciences, 430074 Wuhan, China; [2]National Engineering Research Center for Geographic Information System, 430074 Wuhan, China; [3]GIScience Center, Department of Geography, University of Zurich; [4]Beijing Satellite Navigation Center, Beijing, China

Indoor Positioning Based-On Images Aided by Artificial Neural Networks

Mei-Qin Hung, Jhen-Kai Liao, Kai-Wei Chiang
National Cheng Kung University, Taiwan

Adaptive Strategy-based Tightly-coupled INS/GNSS Integration System Aided by Odometer and Barometer

Yu Chi Tien, You Liang Chen, Kai Wei Chiang
National Cheng Kung University, Taiwan (R.O.C.)

ISSDQ-02: Spatial Data Quality on Images

Time: Wednesday, 12/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 3
Session Chair: Alfred Stein
Session Chair: Mahmoud Delevar

Mountainous Remote Sensing Images Registration Based on Improved Optical Flow Estimation

Ruitao Feng, Xinghua Li, Huanfeng Shen
Wuhan University, China, People's Republic of

Comparative Study of The Different Versions of The General Image Quality Equation

Alvaro Quinteros Valenzuela, Juan Carlos Galvez Reyes
Chilean Air Force, Chile

Quality Check of Crisis Maps Produced over Five Years by Copernicus EMS

Katarina Spasenovic, Daniela Carrion
Politecnico di Milano, Italy

LS-03: Registration and Change Detection

Time: Wednesday, 12/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 2
Session Chair: Bisheng Yang
Session Chair: Roderik Lindenbergh

Change Detection Between Digital Surface Models from Airborne Laser Scanning and Dense Image Matching Using Convolutional Neural Networks

Zhenchao Zhang[1], George Vosselman[1], Markus Gerke[2], Claudio Persello[1], Devis Tuia[3], Michael Ying Yang[1]
[1]University of Twente, Faculty ITC, the Netherlands; [2]Institute of Geodesy and Photogrammetry, Technical University of Brunswick; [3]Wageningen University and Research

Fast Pairwise Coarse Registration Between Point Clouds of Construction Sites using 2D Projection Based Phase Correlation

Rong Huang[1], Zhen Ye[1], Richard Boerner[1], Wei Yao[2], Yusheng Xu[1], Uwe Stilla[1]
[1]Photogrammetry and Remote Sensing, Technical University of Munich, 80333 Munich, Germany; [2]Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University, Hung Hom, Hong Kong

Mobile Mapping of the La Corona Lavatube on Lanzarote

Helge Andreas Lauterbach[1], Dorit Borrmann[1], Andreas Nüchter[1], Angelo Pio Rossi[2], Vikram Unnithan[2], Patrizio Torrese[3], Riccardo Pozzobon[4]
[1]Julius-Maximilians-University Würzburg, Germany; [2]Jacobs University Bremen gGmbH, Germany; [3]Università di Pavia, Italy; [4]Università di Padova, Italy

UAVG-09a: UAV for Mapping: Experiences and Best Practices

Time: Wednesday, 12/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 1
Session Chair: Markus Gerke
Session Chair: Caroline Gevaert

Photogrammetric Assessment and Comparison of DJI Phantom 4 Pro and Phantom 4 RTK Small Unmanned Aircraft Systems

Maria Valasia Peppa, James Hall, James Goodyear, Jon Mills
Newcastle University, United Kingdom

UAV-based cadastral mapping: An assessment of the impact of flight parameters and ground truth measurements on the absolute accuracy of derived orthoimages

Claudia Stöcker[1], Francesco Nex[1], Mila Koeva[1], Markus Gerke[2]
[1]University of Twente, Netherlands, The; [2]Technische Universität Braunschweig, Germany

Evaluation of Camera Positions and Ground Points Quality in a GNSS-NRTK Based UAV Survey: Preliminary Results from a Practical Test in Morphological Very Complex Areas

Emanuele Tufarolo[1,2], Claudio Vanneschi[3], Marco Casella[4], Riccardo Salvini[1,2]
[1]Department of Physical Sciences, Earth and Environment, University of Siena; [2]Centre of Geotechnologies, University of Siena; [3]CGT Spinoff s.r.l.; [4]AeroDron s.r.l.

UAVG-09b: ITS4LAND II

Time: Wednesday, 12/Jun/2019: 2:30pm - 3:30pm · *Location:* Carré 2K
Session Chair: Mila Koeva

SMARTSKEMA: Bringing Land Tenure Sketch Maps to Life

Malumbo Chipofya, Sahib Jan
University of Muenster, Germany

Towards Cadastral Intelligence

Sophie Crommelinck
University of Twente, Netherlands, The

Publish and Share - Integrated ITS4LAND Tools into a Common Platform

Christian Timm
Hansa Luftbild, Germany

IND-07: Indoor Mapping II

Time: Wednesday, 12/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 4
Session Chair: Ville Lehtola
Session Chair: Sisi Zlatanova

An RGB-D Data Processing Framework for Mapping Indoor Environments

Walid Darwish[1,2], Wenbin Li[2], Shengjun Tang[3], Yaxin Li[2], Wu Chen[2]
[1]Vrije Universiteit Brussels, Belgium; [2]The Hong Kong University; [3]Shenzhen University

Reinforcement Learning and SLAM Based Approach for Mobile Robot Navigation in Unknown Environments

Khaled Mustafa[1], Nicolo Botteghi[1], Beril Sirmacek[1], Mannes Poel[2], Stefano Stramigioli[1]
[1]Robotics and Mechatronics, Faculty of Electrical Engineering, Mathematics and Computer Science, University of Twente, The Netherlands; [2]Data Science, Faculty of Electric Engineering, Mathematics and Computer Science, University of Twente, The Netherlands

Indoor Scene Registration Based on Siamese Network and PointNet

Zheng Zhang[1], Chenglu Wen[1], Yiping Chen[1], Wei Li[1], Changbin You[1], Cheng Wang[1], Jonathan Li[1,2]
[1]Xiamen University, China, People's Republic of; [2]University of Waterloo, Waterloo, Canada

A Frequency-Drift Compensated Closed-Form Solution for Stereo RGB-D Mapping

Shengjun Tang[1], Qing Zhu[2], Wu Chen[3], Weixi Wang[1], You Li[1], Walid Darwish[1], Wenbin Li[1]
[1]Research Institute for Smart Cities & Shenzhen Key Laboratory of Spatial Information Smart Sensing and Services, School of Architecture and Urban Planning, Shenzhen University, Shenzhen, PR China; [2]Faculty of Geosciences and Environmental Engineering of Southwest Jiaotong University, Chengdu, China; [3]Department of Land Surveying & Geo-Informatics, The Hong Kong Polytechnic University, Hung Hom, Hong Kong, China

Closing Indoor3D

Zhizhong Kang
China University of Geosciences

ISSDQ-03: The Latest in Methodology of Spatial Data Quality

Time: Wednesday, 12/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 3
Session Chair: Wenzhong Shi
Session Chair: Mahmoud Delevar

Quality Control for Crowdsourcing Large Scale Topographic Maps

Irit Bekker Peretz, Yaron Felus
Survey of Israel, Israel

A New Thinking of LULC Classification Accuracy Assessment

Ke-Sheng Cheng[1,2], J.L. Ling[1], T.W. Lin[1], Y.T. Liu[1], Y.C. Shen[1], Y. Kono[3]
[1]Department of Bioenvironmental Systems Engineering, National Taiwan University, Taiwan; [2]Master Program in Statistics, National Taiwan University; [3]Kyoto University

Classification Accuracy Assessment for Regional Vector Data Product Based on Spatial Sampling: A Case Study of Japan

Yao Lu[1,2], Jixian Zhang[2], Xiaohua Tong[1], Wenli Han[2], Haitao Zhao[2]
[1]Tongji University, Shanghai, People's Republic of China; [2]National Quality Inspection and Testing Center For Surveying and Mapping Products, Beijing, People's Republic of China

A Process-Oriented Spatiotemporal Clustering Method for Complex Trajectories

Jingyi Liu, cunjin Xue, chengbin Wu, qing Dong
Aerospace Information Research Institute,CAS, China

SDQO and SfO, Ontologies for Spatial Data Quality Assessment

Cemre YILMAZ, Cetin COMERT, Deniz YILDIRIM
Karadeniz Technical University, Turkey

LS-04: Environmental Mapping

Time: Wednesday, 12/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 2
Session Chair: Martin Rutzinger
Session Chair: Michael James Olsen

L1-norm Fitting of Elliptic Paraboloids with Prior Information for Enhanced Coniferous Tree Localization in ALS Point Clouds

Przemyslaw Polewski[1], Wei Yao[1], Marco Heurich[2,3]
[1]The Hong Kong Polytechnic University, Hong Kong S.A.R. (China); [2]Bavarian Forest National Park, 94481 Grafenau, Germany; [3]University of Freiburg, 79106 Freiburg, Germany

Comparison of Forest Structure Metrics Derived from UAV LiDAR and ALS Data

Moritz Bruggisser[1], Markus Hollaus[1], Daniel Kükenbrink[2], Norbert Pfeifer[1]
[1]Department of Geodesy and Geoinformation, TU Wien, Austria; [2]Remote Sensing Laboratories, Department of Geography, University of Zurich, Switzerland

The Potential of Dual-Wavelength Terrestrial Laser Scanning in 3D Canopy Fuel Moisture Content Mapping

Ahmed Elsherif, Rachel Gaulton, Jon Mills
Newcastle University, United Kingdom

Potential and Limitations of Terrestrial Laser Scanning for Discontinuity Roughness Estimation

Maja Bitenc[1], Kieffer D. Scott[1], Khoshelham Kourosh[2]
[1]Graz University of Technology, Austria; [2]The University of Melbourne, Victoria, Australia

Unmanned Aerial Vehicle Laser Scanning for Erosion Monitoring in Alpine Grassland

Andreas Mayr[1], Magnus Bremer[1], Martin Rutzinger[2], Clemens Geitner[1]
[1]University of Innsbruck, Austria; [2]Austrian Academy of Sciences, Austria

UAVG-10: UAV Photogrammetry II

Time: Wednesday, 12/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 1
Session Chair: Francesco Nex

Investigations on the Geometric Quality of Cameras for UAV Applications Using the High Precision UAV Test Field Zollern Colliery

Heinz-Jürgen Przybilla[1], Markus Gerke[2], Isabelle Dikhoff[2], Yahya Ghassoun[2]
[1]Lab for Photogrammetry, Bochum University of Applied Sciences, Germany; [2]Institute of Geodesy and Photogrammetry, TU Braunschweig, Germany

Simulation and Analysis of Photogrammetric UAV Image Blocks : Influence of Camera Calibration Error

Yilin Zhou, Ewelina Rupnik, Christophe Meynard, Christian Thom, Marc Pierrot-Deseilligny
LaSTIG, IGN, ENSG, University Paris-Est, F-94160 Saint-Mande, France

Closing UAV-g

Francesco Nex
University of Twente, The Netherlands

iSSDQ-04: Novel Applications of Spatial Data Quality

Time: Thursday, 13/Jun/2019: 9:00am - 10:30am · *Location:* Waaier 4
Session Chair: Mahmoud Delevar
Session Chair: Wenzhong Shi

Evaluation of Digital Elevation Models for Geomorphometric Analyses on Different Scales for Northern Chile

Tanja Kramm, Dirk Hoffmeister
Institute of Geography, University of Cologne, Germany

Soil Moisture Analysis Using Multispectral Data in North Central Part of Mongolia

Enkhjargal Natsagdorj[1,2], Tsolmon Renchin[2], Philippe De Maeyer[1], Batchuluun Tseveen[3], Chimgee Dari[4], Erdenebaatar Dashdondog[5]
[1]Dept. of Geography, Ghent University, Belgium; [2]NUM-ITC-UNESCO Laboratory for Space Science and Remote Sensing, National university of Mongolia, Mongolia; [3]Dept. of Environment and Forest Engineering, National University of Mongolia, Mongolia; [4]Dept. of Management, School of Business, National University of Mongolia, Mongolia; [5]Dept. of Physics, National University of Mongolia, Mongolia

A Preliminary Quality Analysis of the Climate Change Initiative Land Cover Products for Continental Portugal

Cidália Costa Fonte[1], Myroslava Lesiv[2], Linda See[2], Steffen Fritz[2]
[1]Department of Mathematics, University of Coimbra, Portugal; Institute for Systems Engineering and Computers at Coimbra (INESCC), Coimbra, Portugal; [2]International Institute for Applied Systems Analysis, Laxenburg, Austria

Sensitivity of Actual Evapotranspiration estimation using the SEBS Model to variation of input parameters (LST, DSSF, aerodynamics parameters, LAI, FVC)

Nesrine Abid[1], Chris M Mannaerts[2], Bargaoui Zoubeida[1]
[1]Université de Tunis El Manar, Ecole Nationale d'ingénieurs de Tunis, ENIT (Tunisia); [2]University of Twente, Faculty of Geo-Information Sciences and Earth Observation (ITC) (the Netherlands)

Evaluation of The Long-Term Effects of Exposure to Greenspace on Type 2 Diabetic Patients: Case Study - Tehran, Iran

Amin Esmaeilzadeh[1], Mahmoud reza Delavar[1], Ensieh Nasli-Esfahani[2]
[1]College of Engineering, University of Tehran, Tehran, Iran; [2]Tehran University of Medical Sciences, Tehran, Iran

JS-03: Single Photon Lidar

Time: Thursday, 13/Jun/2019: 9:00am - 10:30am · *Location:* Waaier 1
Session Chair: Martin Rutzinger
Session Chair: Cheng Wang

Keynote: Single Photon Sensitive Lidar Systems – Current State-of-the-art and Challenges

Craig Glennie
University of Houston, United States of America

A Comparison of Single Photon and Full Waveform LiDAR

Gottfried Mandlburger[1,2], Hubert Lehner[3], Norbert Pfeifer[1]
[1]TU Vienna, Department of Geodesy and Geoinformation, Austria; [2]University of Stuttgart, Institute for Photogrammetry, Germany; [3]City of Vienna, Municipal Department 41, Austria

Investigation into the Potential of Single Photon Airborne Laser Scanning Technology

Charly Bernard[1], Jon Mills[2], Julià Talaya[3], Fabio Remondino[4]
[1]ENSG, IGN, France; [2]Newcastle University, UK; [3]Institut Cartogràfic i Geològic de Catalunya, Spain; [4]FBK Trento, Italy

Optimisation Of The Calibration Process of a K-TLS Based Multi-Sensor-System by Genetic Algorithms

Jens Hartmann, Ilka von Gösseln, Niklas Schild, Alexander Dorndorf, Jens-André Paffenholz, Ingo Neumann
Leibniz University Hannover, Geodetic Institute, Germany

PRSM-01: Planetary Mapping

Time: Thursday, 13/Jun/2019: 9:00am - 10:30am · *Location:* Waaier 3
Session Chair: Kaichang Di
Session Chair: Jürgen Oberst

Keynote: Exploring Europa with EIS — The Europa Imaging System

Randolph Kirk
United States Geological Survey, United States of America

Multi-resolution 3D Mapping of RSLs at Valles Marineris

Yu Tao, Jan-Peter Muller
Imaging Group, Mullard Space Science Laboratory, University College London

Atmospherically Compensated Shape from Shading on the Martian Surface: Towards the Perfect Digital Terrain Model of Mars.

Marcel Hess[1], Kay Wohlfarth[1], Arne Grumpe[1], Christian Wöhler[1], Ottaviano Ruesch[2], Bo Wu[3]
[1]Image Analysis Group, TU Dortmund, 44227 Dortmund, Germany; [2]European Space Research and Technology Center, Noordwijk, the Netherlands; [3]Department of Land Surveying and Geo Informatics, The Hong Kong Polytechnic University, Hung Hom, Kow-loon, Hong Kong

SGA-01: Imagery-based applications

Time: Thursday, 13/Jun/2019: 9:00am - 10:30am · *Location:* Waaier 2
Session Chair: Mila Koeva
Session Chair: Giorgio Agugiaro

An Evaluation of Landslide Susceptibility Mapping Using Remote Sensing Data and Machine Learning Algorithms in Iran

Bahareh Kalantar[1], Naonori Ueda[1], Husam A. H. Al-Najjar[2], Mohamed Barakat A. Gibril[3], Usman Salihu Lay[4], Alireza Motevalli[5]

[1]RIKEN Center for Advanced Intelligence Project, Goal-Oriented Technology Research Group, Disaster Resilience Science Team, Tokyo 103-0027, Japan; [2]Centre for Advanced Modelling and Geospatial Information Systems (CAMGIS), Faculty of Engineering and IT, University of Technology Sydney, 2007 NSW, Australia; [3]Research Institute of Sciences and Engineering, University of Sharjah, Sharjah 27272, UAE; [4]Department of Civil Engineering, Faculty of Engineering, Universiti Putra Malaysia, Serdang, Selangor, Malaysia; [5]Department of Watershed Management Engineering, College of Natural Resources, Tarbiat Modares University, Noor, Mazandaran, Iran

The Roles of Urban Buildings and Vegetation in Adjusting Seasonal and Daily Air Temperature

Yuliang Lan[1,2,3], Zhengdong Huang[1,2,3], Renzhong Guo[1,2,3], Qingming Zhan[4]

[1]Research Institute for Smart Cities, School of Architecture and Urban Planning, Shenzhen University, Shenzhen, PR China; [2]Laboratory of Spatial Information Smart Sensing and Services, School of Architecture and Urban Planning, Shenzhen University, Shenzhen, PR China; [3]Key Laboratory for Geo-Environmental Monitoring of Coastal Zone of the National Administration of Surveying, Mapping and GeoInformation, Shenzhen University, Shenzhen, PR China; [4]Collaborative Innovation Center of Geospatial Technology, 129 Luoyu Road, Wuhan 430079, PR China

Spatiotemporal Change of Urban Agriculture Using Google Earth Imagery: A Case of Municipality of Nakhonratchasima City, Thailand

yaowaret jantakat[1], Pongpun Juntakut[2], Sasikarn Plaiklang[3], Worapon Arre[1], Chomphak Jantakat[4]

[1]Rajamangala University of Technology Isan; [2]Academic Division of Chulachomklao Royal Military Academy; [3]Rambhaibarni Rajabhat University; [4]Vongchavalitkul University

COW-01: Orientation and Mapping

Time: Thursday, 13/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 2
Session Chair: Jan Skaloud
Session Chair: Andrea Maria Lingua

Correction of Mobile Mapping Trajectories in GNSS-Denied Environments Using Aerial Nadir and Aerial Oblique Images

Phillipp Fanta-Jende[1], Francesco Nex[1], Markus Gerke[2], George Vosselman[1]
[1]University of Twente, Faculty ITC, the Netherlands; [2]Braunschweig University of Technology

Deep Lidar Odometry

Qing Li[1], Cheng Wang[1,2], Shaoyang Chen[1], Xin Li[3], Chenglu Wen[1], Ming Cheng[1], Jonathan Li[1,4]
[1]Fujian Key Laboratory of Sensing and Computing for Smart City and the School of Information Science and Engineering, Xiamen University, Xiamen 361005, China; [2]Fujian Collaborative Innovation Center for Big Data Applications in Governments, Fuzhou 350003, China; [3]Geometric and Visual Computing (GVC) Group, Louisiana State University, USA; [4]GeoSTARS Lab, the Department of Geography and Environmental Management, University of Waterloo, Canada

Hybrid Orientation of Airborne LiDAR Point Clouds and Aerial Images

Philipp Glira[1,2], Norbert Pfeifer[1], Gottfried Mandlburger[1,3]
[1]TU Vienna, Department of Geodesy and Geoinformation, Vienna, Austria; [2]Austrian Institute of Technology (AIT), Vienna, Austria; [3]University of Stuttgart, Institute for Photogrammetry, Stuttgart, Germany

Progress on ISPRS Benchmark on Multisensory Indoor Mapping and Positioning

Cheng Wang[1], Yudi Dai[1], Naser Elsheimy[2], Chenglu Wen[1], Guenther Retscher[3], Zhizhong Kang[4], Andrea Lingua[5]
[1]Xiamen University, China, China, People's Republic of; [2]University of Calgary, Canada; [3]Vienna University of Technology, Austria; [4]China University of Geosciences, Beijing. China; [5]Polytechnic University of Turin, Italy

ISSDQ-05: Spatial Data Quality and Uncertainty Assessment in Smart Cities

Time: Thursday, 13/Jun/2019: 11:00am - 12:30pm · *Location:* Carré 2K
Session Chair: Wenzhong Shi
Session Chair: Alfred Stein

Discussion on "Spatial Data Quality and Uncertainty Assessment in Smart Cities"

Alfred Stein[1], Wenzhong Shi[2], Mahmoud Delavar[3]
[1]University of Twente, The Netherlands; [2]The Hong Kong Polytechnic University; [3]University of Tehran

Closing ISSDQ

Alfred Stein[1], Wenzhong Shi[2], Mahmoud Delavar[3]
[1]University of Twente, The Netherlands; [2]The Hong Kong Polytechnic University; [3]University of Tehran

JS-04: Big Data

Time: Thursday, 13/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 1
Session Chair: Jan Boehm
Session Chair: Eric Guilbert

Keynote: nD-PointCloud for Managing Massive Data Sets

Peter van Oosterom
TU Delft, Netherlands, The

Piecewise-Planar Approximation of Large 3D Data as Graph-Structured Optimization

Stephane Guinard, Loic Landrieu, Laurent Caraffa, Bruno Vallet
IGN, France

A Fast Voxel-Based Indicator for Change Detection Using Low Resolution Octrees

Joachim Gehrung[1,2], Marcus Hebel[1], Michael Arens[1], Uwe Stilla[2]
[1]Fraunhofer Institute of Optronics, System Technologies and Image Exploitation IOSB, Germany; [2]Technische Universitaet Muenchen

K-Nearest Neighbour Query Performance Analyses on a Large Scale Taxi Dataset: Postgresql vs. Mongodb

Ihsan Bugra Coskun[1], Sibel Sertok[2], Berk Anbaroglu[3]
[1]Dept. of Geomatics Engineering, Hacettepe University, Turkey; [2]Dept. of Statistics, Hacettepe University, Turkey; [3]Dept. of Geomatics Engineering, Hacettepe University, Turkey

PRSM-02: Planetary Photogrammetry

Time: Thursday, 13/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 3
Session Chair: Bo Wu
Session Chair: Christian Wöhler

Planetary3D: A Photogrammetric Tool for 3D Topographic Mapping of Planetary Bodies

Han Hu, Bo Wu
Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University

Performance Evaluation of 3DPD, a Photogrammetric Pipeline for the Cassis Stereo Images

Cristina Re[1], Stepan Tulyakovb[2], Emanuele Simioni[1], Teo Mudric[1], Gabriele Cremonese[1], Nicolas Thomas[3]
[1]INAF Osservatorio Astronomico di Padova, Vicolo dell'Osservatorio 5, 35122, Padova, Italy; [2]Dept. of Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland; [3]Physics Institute, Space Research and Planetary Sciences - University of Bern, Sidlerstrasse 5, 3012 Bern, Switzerland

Bundle Adjustment of Spaceborne Double-Camera Push-Broom Imagers and its Application to LROC NAC Imagery

Isabel Haase[1], Philipp Gläser[1,2], Jürgen Oberst[1,3]
[1]Technical University Berlin, Germany; [2]Ronin Institute for Independent Scholarship, USA; [3]German Aerospace Center, Germany

A Generic Rigorous Sensor Model for Photogrammetric Processing of Pushbroom Planetary Images

Xun Geng[1,2], Shuai Xing[1], Qing Xu[1]
[1]Zhengzhou Institute of Surveying and Mapping, China; [2]Xi'an Information Technique Institute of Surveying and Mapping, China

Vision Based Obstacle Detection using Rover Stereo Images

Yexin Wang[1], Man Peng[1], Kaichang Di[1], Wenhui Wan[1], Zhaoqin Liu[1], Zongyu Yue[1], Yan Xing[2], Xiaoyan Mao[2], Baoyi Teng[2]
[1]State Key Laboratory of Remote Sensing Science, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, Beijing, China; [2]Beijing Institute of Control Engineering, Beijing, China

SGA-02: Energy, BIM

Time: Thursday, 13/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 4
Session Chair: Giorgio Agugiaro
Session Chair: Mila Koeva

Keynote: Urban Energy Simulation and Semantic 3D City Models: a Return on Experiences with CitySim

Jérôme Kaempf
Ecole Polytechnique Fédérale de Lausanne, Switzerland

Unbroken Digital Data Flow in the Built Environment Process - A Case Study in Sweden

Per-Ola Olsson[1], Tim Johansson[1], Helen Eriksson[1,2], Thomas Lithen[2], Lars-Håkan Bengtsson[2], Josefine Axelsson[3], Ulrika Roos[2], Karin Neland[2], Birgitta Ryden[2], Lars Harrie[1]
[1]Department of Physical Geography and Ecosystem Science, Lund University, Sweden; [2]Lantmäteriet - the Swedish mapping, cadastral and land registration authority, Sweden; [3]Sweco, Sweden

Geobim Benchmark 2019: Design and Initial Results

Francesca Noardo[1], Ken Arroyo Ohori[1], Filip Biljecki[2], Thomas Krijnen[5], Claire Ellul[3], Lars Harrie[4], Jantien Stoter[1]
[1]Department of Urbanism, Delft University of Technology, Delft (The Netherlands); [2]Department of Architecture, National University of Singapore, Singapore; [3]Department of Civil, Environmental and Geomatic Engineering, University College London, London, UK; [4]Department of physical geography, Lund University, Lund, Sweden.; [5]Department of the Built Environment - Eindhoven University of Technology (The Netherlands)

IS-04: Gold sponsor presentations: IGI and Agisoft

Time: Thursday, 13/Jun/2019: 1:15pm - 2:15pm · *Location:* Waaier 2
Session Chair: Siavash Hosseinyalamdary

1:15pm - 1:45pm

Modular Multi Sensor Systems from IGI

Nazeer Saeed
IGI mbH, Germany

1:45pm - 2:15pm

New features in Agisoft Metashape

Boris Simiyutin
AgiSoft, Russia

PS-04: Poster session

Time: Thursday, 13/Jun/2019: 1:30pm - 2:30pm · *Location:* Foyer

Performance of GNSS Carrier-Tracking Loop Based on Kalman Filter in A Challenging Environment

Yiran Luo[1,2,3], Chunyang Yu[3], Jian Li[1,2], Naser El-Sheimy[3]

[1]Radar Research Lab, School of Information and Electronics, Beijing Institute of Technology, Beijing, China; [2]Key Laboratory of Electronic and Information Technology in Satellite Navigation (Beijing Institute of Technology), Ministry of Education, Beijing, China; [3]Department of Geomatics Engineering, University of Calgary, Calgary, Canada

A Comparison of UWB and Motion Capture UAV Indoor Positioning

Andrea Masiero, Francesca Fissore, Riccardo Antonello, Angelo Cenedese, Antonio Vettore

University of Padua, Italy

Hyperbolic Distortion Model for Radial Distortion Correction

Guy Blanchard Ikokou[1], Lloyd Smit Julian[2]

[1]Thswane University of Technology, South Africa; [2]University of Cape Town

Investigation of Sustainable Urban Development Direction Considering Social, Economic, and Environmental Perspectives Using Geospatial Information Systems (Case Study: Zanjan City)

Zohreh Masoumi[1], John Van Genderen[2]

[1]Departement of Earth Science, Institute for Advanced Studies in Basic Sciences, Iran, Islamic Republic of; [2]Department of Earth Observation Sciences (ITC), University of Tewnte, Enschede

Indoor Positioning Using Convolution Neural Network to Regress Camera Pose

Jing-Mei Ciou, Hsueh-Chan Lu

Department of Geomatics, National Cheng Kung University, Taiwan

Hierarchical Data Model for Storage and Indexing of Massive Street View

Mingyi Du, Jian Wang, Changfeng Jing, Jie Jiang, Qiang Chen

School of Geomatics and Urban Spatial Informatics, Beijing University of Civil Engineering and Architecture, Beijing, China

A Novel Denoising Algorithm for Airborne LiDAR Point Cloud Based on Empirical Mode Decomposition

Zhenyang Hui, Penggen Cheng, Leyang Wang, Yuanping Xia, Haiying Hu, Xiaoning Li

East China University of Technology, China, People's Republic of

An Instrumental Basis for Multispectral Lidar with Spectrally-Resolved Distance Measurements

David Salido-Monzú, Andreas Wieser

ETH Zurich, Switzerland

Automated Visibility Field Evaluation of Traffic Sign Based On 3D LiDAR Point Clouds

Shanxin Zhang[1,2], Cheng Wang[1], Ming Cheng[1], Jonathan Li[3]

[1]Fujian Key Laboratory of Sensing and Computing for Smart City, School of Information Science and Engineering, Xiamen University, Xiamen, China; [2]Xizang Key Laboratory of Optical Information Processing and Visualization Technology, Information Engineering College, Xizang Minzu University, Xianyang, China; [3]Department of Geography and Environmental Management, Faculty of Environment, University of Waterloo, Waterloo, Canada

An Improved Coherent Point Drift Method for TLS Point Cloud Registration of Complex Scenes

Yufu Zang[1,2], Roderik Lindenbergh[2]

[1]School of Remote Sensing & Geomatics Engineering, Nanjing University of Information Science & Technology; [2]Department of Geoscience and Remote Sensing, Delft University of Technology

Extraction of Leaf Angle Distribution from an Individual Broadleaf Tree Using Terrestrial Laser Scanning Data

Yiming Chen[1], Zhengjun Liu[1], Wuming Zhang[2], Chen Qiao[3]

[1]Chinese Academy of Surveying & Mapping, Beijing 100036, China; [2]Institute of Remote Sensing Science and Engineering, Faculty of Geographical Science, Beijing Normal University, Beijing 100875, China; [3]Department of Earth System Science, Tsinghua University, Beijing 100084, China

Image-Based Vehicle Tracking from Roadside Lidar Data

Jiaxing Zhang[1], Wen Xiao[1], Benjamin Coifman[2], Jon Mills[1]

[1]Newcastle University, Newcastle upon tyne, United Kingdom; [2]The Ohio State University, Columbus, USA

Integration of A Low-Cost Multisensory UAV System for Forest Application

Jianping Li[1], Bisheng Yang[1], Yangzi Cong[1], Senlei Li[1], Yuanwen Yue[2]
[1]State Key Laboratory of Information Engineering in Survey, Mapping and Remote Sensing, Wuhan University; [2]School Of Resource And Environmental Science, Wuhan University

Low-Cost Wheeled Robot-Borne Laser Scanning System for Indoor and Outdoor 3D Mapping Application

W. Wu, C. Chen, Y. Cong, Z. Dong, J. Li, S. Li, W. Dai, B. Yang
State Key Laboratory of Information Engineering in Survey, Mapping and Remote Sensing, Wuhan University

MLS Point Cloud Segmentation Based on Feature Points of Scanlines

Ryohei Honma[1], Hiroaki Date[2], Satoshi Kanai[2]
[1]Asia Air Survey Co., Ltd.; [2]Graduate School of Information Science and Technology, Hokkaido University

Orthographic Reflectance Image for Planar Target Localization in Low Density TLS Point Clouds

Dongxu Guo[1], Dapeng Yu[2], Yubin Liang[1], Chenyang Feng[1]
[1]Tianjin Normal University, China, People's Republic of; [2]Shen Kan Engineering & Technology Corporation, MCC, China, People's Republic of

Simulating Unmanned-Aerial-Vehicle Based Laser Scanning Data for Efficient Mission Planning in Complex Terrain

Magnus Bremer[1,2], Volker Wichmann[3], Martin Rutzinger[2], Thomas Zieher[2], Jan Pfeiffer[2]
[1]University of Innsbruck, Innsbruck, Austria; [2]Institute for Interdisciplinary Mountain Research, Austrian Academy of Sciences, Innsbruck, Austria; [3]Laserdata GmbH, Innsbruck, Austria

Trajectory-Based Visualization of MMS Point Clouds

Genki Takahashi[1,2], Hiroshi Masuda[1]
[1]The University of Electro-Communications; [2]Kokusai Kogyo Co., Ltd., Japan

COW-02: Camera Systems

Time: Thursday, 13/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 4
Session Chair: Ismael Colomina
Session Chair: Julian Smit

Aircraft Based Real Time Bundle Adjustment and Digital Surface Model Generation

Pablo d'Angelo, Franz Kurz
German Aerospace Center (DLR), Germany

Some Improvements on the Orientation of an Oblique Aerial Digital Camera

Michael Gruber, Gerhard Kniewasser
Vexcel Imaging GmbH, Austria

Calibration and Orientation of Modular Multiple Camera Systems

Phillipp Grimm
IGI Systems, Germany

LS-05: Segmentation and Detection

Time: Thursday, 13/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 1
Session Chair: Wen Xiao
Session Chair: Mario Soilán Rodríguez

Describing the Vertical Structure of Informal Settlements on the Basis of Lidar Data - A Case Study for Favelas (Slums) in Sao Paulo City

Silvio Cesar Lima Ribeiro[1,2], Malgorzata Jarzabek-Rychard[3], Jorge Pimentel Cintra[1], Hans-Gerd Maas[4]
[1]Polytechnic School and Paulista Museum, Sao Paulo University, Brazil; [2]Urbanism Secretariat, Sao Paulo City Hall, Brazil; [3]Institute of Geodesy and Geoinformation Science, Technische Universität Berlin, 10623 Berlin Germany; [4]Institute of Photogrammetry and Remote Sensing, Technische Universität Dresden, 01069 Dresden Germany

Structural Segmentation of Point Clouds with Varying Point Density Based on Multi-Size Supervoxels

Yuan Li, Bo Wu
The Hong Kong Polytechnic University, Hong Kong S.A.R. (China)

Automatic Road Structure Detection and Vectorization using MLS Point Clouds

Xiaoxin Mi[1], Bisheng Yang[1], Chi Chen[1], Ming Yang[2], Zhen Dong[1]
[1]State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, Wuhan, China; [2]ShangHai Surveying & Mapping Institute, China

PRSM-03: Planetary Remote Sensing

Time: Thursday, 13/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 3
Session Chair: Kaichang Di
Session Chair: Cristina Re

Lateral Variations in Bulk Density and Porosity of The Upper Lunar Crust from High-Resolution Gravity and Topography Data: Comparision of Different Analysis Techniques

Daniel Wahl[1], Jürgen Oberst[1,2]
[1]Technische Universität Berlin, Chair of Planetary Geodesy, 10623 Berlin, Germany; [2]German Aerospace Center (DLR), Department of Planetary Geodesy, 12489 Berlin, Germany

Lunar Surface Sampling Feasibility Evaluation Method for Chang'e-5 Mission

Jia Wang[1], Chuanling Ma[1], Zining Zhang[1], Yexin Wang[2], Man Peng[2], Wenhui Wan[2], Xiaomeng Feng[1], Xiaoxue Wang[1], Ximing He[1], Yi You[1]
[1]Beijing Aerospace Control Center, Beijing, China; [2]State Key Laboratory of Remote Sensing Science, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, Beijing, China

The Overview of The Planetary Atmospheric Spectral Telescope (PAST) in The Scientific Experimental System in Near-Space (SENSE)

Qingyu Meng[1], Fei He[2], Weiguo Zhao[1], Kejun Wang[1], Libao Yang[1], Jihong Dong[1], Xiaodong Wang[1]
[1]Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences, China, People's Republic of; [2]Institute of Geology and Geophysics, Chinese Academy of Sciences

SGA-03: Urban applications

Time: Thursday, 13/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 2
Session Chair: Jérôme Kaempf
Session Chair: Giorgio Agugiaro

Semantic Validation of Social Media Geographic Information: A Case Study on Instagram Data for Expo Milano 2015

Federica Migliaccio, Daniela Carrion, Francesco Ferrario
Politecnico di Milano, Italy

Spatio-Temporal Modelling & the New Urban Agenda in Post-Apartheid South Africa

Baleseng Tlholohelo Mokoena[1], Thembani Moyo[2], Eric Nyembezi Makoni[3], Walter Musakwa[3]
[1]City of Ekurhuleni, South Africa; [2]Department of Operations and Quality Management, University of Johannesburg, South Africa; [3]Department of Town and Regional Planning, University of Johannesburg, South Africa

C3MGBD-02: Remote Sensing Solutions

Time: Thursday, 13/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 3
Session Chair: Eric Guilbert
Session Chair: Ken Arroyo Ohori

V-RSIR: A Web-Based Tool and Benchmark Dataset for Remote Sensing Image Retrieval

Dongyang Hou[1,2], Huaqiao Xing[3]
[1]School of Geosciences and Info-Physics, Central South University, Changsha, Hunan, China; [2]College of Geography and Environment, Shandong Normal University, Jinan, Shandong, China; [3]School of Surveying and Geo-informatics, Shandong Jianzhu University, Jinan, Shandong, China

Extending Accuracy Assessment Procedures of Global Coverage Land Cover Maps through Spatial Association Analysis

Daniele Oxoli[1], Gorica Bratic[1], Hao Wu[1,2], Maria Antonia Brovelli[1]
[1]Politecnico di Milano, Italy; [2]National Geomatics Center of China, China

Design and Implementation of Crowdsourcing Based China's National Public Geographic Information Collection System

Hongping Zhang[1,2], Jie Jiang[2], Wei Huang[1], Liang Yang[1]
[1]National Geomatics Center of China, China, People's Republic of; [2]School of Geomatics and Urban Spatial Information, Beijing University of Civil Engineering and Architecture, Beijing, China

A Semantic Retrieval System for Remote Sensing Web Platforms

Gilles-Antoine Nys[1], Jean-Paul Kasprzyk[1], Pierre Hallot[2], Roland Billen[1]
[1]Geomatics Unit, University of Liège, Belgium; [2]LNA-DIVA, University of Liège, Belgium

COW-03: Navigation and Dynamic Networks

Time: Thursday, 13/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 4
Session Chair: Steffen Schön
Session Chair: Craig Glennie

Keynote: GNSS in Urban Areas – Benefits and Limits of Collaborative Positioning

Steffen Schön
Leibniz Universität Hannover, Germany

Collaborative Navigation Simulation Tool Using Kalman Filter with Implicit Constraints

Nicolas Garcia Fernandez, Steffen Schön, Hamza Alkhatib
Leibniz Universität Hannover, Germany

What Can Dynamic Geodetic Networks Do for Sensor Orientation?

Ismael Colomina, Marta Blazques, Pere Molina
Geonumerics

ON RAW INERTIAL MEASUREMENTS IN DYNAMIC NETWORKS

Davide Antonio Cucci, Jan Skaloud
Geodetic Engineering Laboratory, EPFL, Switzerland

LS-06: Intensity and Full Waveform

Time: Thursday, 13/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 1
Session Chair: Martin Weinmann
Session Chair: Kourosh Khoshelham

Combined Multiple Classified Datasets Classification Approach for Point Cloud LiDAR Data

Nagwa El-Ashmawy[1], Ahmed Shaker[2]
[1]Survey Research Institute, National Water Research Center - Egypt; [2]Ryerson University, Toronto - Canada

Pavement Marking Reflectivity Evaluation Through Radiometric Calibration of The Leica P40 Terrestrial Laser Scanner

Erzhuo Che, Michael James Olsen, Chris Parrish, Jaehoon Jung
Oregon State University, United States of America

Automatic IN-SITU Self-Calibration of A Panoramic TLS from A Single Station Using 2D Keypoints

Tomislav Medic, Heiner Kuhlmann, Christoph Holst
University of Bonn, Germany

Detection and Extraction of Water Bottom Topography from Laserbathymetry Data by using Full-Waveform-Stacking Techniques

David Mader[1], Katja Richter[1], Patrick Westfeld[2], Robert Weiß[3], Hans-Gerd Maas[1]
[1]Technische Universität Dresden, Germany; [2]Federal Maritime and Hydrographic Agency (BSH), Germany; [3]German Federal Institute of Hydrology, Germany

Closing Laser Scanning

Jan Boehm
University College London, United Kingdom

PRSM-04: Feature Extraction from Planetary Data

Time: Thursday, 13/Jun/2019: 4:00pm - 5:30pm · *Location:* Carré 2K
Session Chair: Randolph Kirk
Session Chair: Emerson Speyerer

Automated Detection of Lunar Ridges Based on DEM Data

Man Peng, Yexin Wang, Zongyu Yue, Kaichang Di
Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences

Assessment of Feature Detectors and Descriptors in Remote Images of Planetary Bodies

Emerson Speyerer
Arizona State University, United States of America

Anomaly Detection Performance Comparison on Anomaly-Detection Based Change Detection on Martian Images

Alfiah Rizky Diana Putri, Panagiotis Sidiropoulos, Jan-Peter Muller
University College London, United Kingdom

A Gradient-Region Constrained Level Set Method for Autonomous Rock Detection from Mars Rover Image

Juntao Yang, Zhizhong Kang
China university of Geoscience, China, People's Republic of

Relief of Mercury and The Moon: from Morphometry to Morphological Mapping

Anastasia Zharkova[1,2], Maria Kolenkina[1], Alexander Kokhanov[1], Irina Karachevtseva[1]
[1]Moscow State University of Geodesy and Cartography (MIIGAIK), Russian Federation; [2]Moscow State University Sternberg Astronomical Institute, Russian Federation

SGA-04: Traffic Applications

Time: Thursday, 13/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 2
Session Chair: Mila Koeva
Session Chair: Giorgio Agugiaro

Application Research of LOD Technology and The Shortest Path Algorithm in Traffic Geographic Information System

Xunhu Zhang[1], Xunlian Zhang[2], He Zhang[1]
[1]National Quality Inspection and Testing center for Surveying and Mapping product, China, People's Republic of; [2]Renfeng Town Central Primary School, Jiyang District, Jinan City, Shandong Province, China

Exploring the Relationship Between Travel Pattern and Social-Demographics Using Smart Card Data and Household Survey

Yang Zhang, Tao Cheng, Nilufer Sari Aslam
University College London, United Kingdom

Ranking Nodes in Complex Networks: A Case Study of The Gaubus

Thembani Moyo, Walter Musakwa
University of Johannesburg, South Africa

Local Maximum Density Approach for Small-scale Clustering of Urban Taxi Stops

Han Wang[1], Xiao-Jian Chen[2], Ying Wang[1], Jie Shan[3]
[1]School of Remote Sensing and Information Engineering, Wuhan University, Wuhan 430079, China; [2]State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, Wuhan 430079, China; [3]Lyles School of Civil Engineering, Purdue University, West Lafayette, IN 47907, USA

Closing SmartGeoApps

Giorgio Agugiaro[1], Mila Koeva[2]
[1]Delft University of Technology, The Netherlands; [2]University of Twente, The Netherlands

C3MGBD-03: Road Network

Time: Friday, 14/Jun/2019: 9:00am - 10:30am · *Location:* Waaier 4
Session Chair: Maria Antonia Brovelli
Session Chair: Daniele Oxoli

Floating Car Data (FCD) for Mobility Applications

Andrea Ajmar[1], Emere Arco[2], Piero Boccardo[2], Francesca Perez[1]
[1]ITHACA, Torino, Italy; [2]Politecnico di Torino, Italy

A Method of Urban Road Network Extraction Based on Floating Car Trajectory Data

Chunlei Mi[1,2], Feng Lu[1,2]
[1]Institute of Geographic Sciences and Natural Research, CAS, China; [2]Chinese Academy of Sciences, China

Updating a Road Network Dataset Exploiting the Results of Semantic Segmentation Techniques Applied to Street-Level Imagery

Andrea Ajmar[1], Emere Arco[2], Piero Boccardo[2], Fabio Giulio Tonolo[3], Janine Yoong[4]
[1]ITHACA Information Technology for Humanitarian Assistance, Cooperation and Action, Torino, Italy; [2]Politecnico di Torino - DIST, Torino, Italy; [3]Politecnico di Torino - DAD, Torino, Italy; [4]Mapillary Inc.. Brooklyn NY, USA

Road Network Comparison and Matching Techniques. A Workflow Proposal for The Integration of Traffic Message Channel and Open Source Network Datasets

Emere Arco[1], Andrea Ajmar[2], Piero Boccardo[1]
[1]Politecnico di Torino, Italy; [2]ITHACA Information Technology for Humanitarian Assistance, Cooperation and Action, Turin, Italy

Analysis of Roads in Tanzania, Uganda and Kenya Using Free and Open Source Software

Stefan Jovanovic, Dina Jovanovic, Gorica Bratic, Maria Antonia Brovelli
Politenico di Milano, Italy

COW-04: Calibration I

Time: Friday, 14/Jun/2019: 9:00am - 10:30am · *Location:* Waaier 2
Session Chair: Norbert Haala
Session Chair: Antonio Maria Garcia Tommaselli

Calibration of Airborne Camera Systems with Diffractive Optical Elements

Dennis Dahlke, Henry Meißner, Matthias Geßner, Karsten Stebner, Denis Grießbach, Ralf Berger, Anko Börner
German Aerospace Centre, Germany

Camera Calibration with Irrational Radial Distortion Model with Analytical Solutions

Guy Blanchard Ikokou[1], Lloyd Smit Julian[2]
[1]Thswane University of Technology, South Africa; [2]University of Cape Town

Automatic Detection and Labelling of Photogrammetric Control Points in a Calibration Test Field

David Jarron[1], Mozhdeh Shahbazi[1], Derek Lichti[1], Robert Radovanovic[2]
[1]Dept. of Geomatics Engineering, University of Calgary, T2N 1N4 Calgary AB, Canada; [2]McElhanney Geomatics Engineering Ltd., T2G 0Y4 Calgary, AB, Canada

Automatic Camera System Calibration with A Chessboard Enabling Full Image Coverage

Jürgen Wohlfeil, Denis Grießbach, Ines Ernst, Dirk Baumbach, Dennis Dahlke
German Aerospace Center, Institute of Optical Sensor Systems

Assessment of Chromatic Aberrations for GoPro 3 Cameras in Underwater Environments

Petra Helmholz[1], Derek Lichti[2]
[1]Discipline of Spatial Sciences, School for Earth and Planetary Sciences, Curtin University, Australia; [2]Department of Geomatics Engineering, The University of Calgary, Canada

JS-05: SAR in Cryosphere and Hydrosphere

Time: Friday, 14/Jun/2019: 9:00am - 10:30am · *Location:* Waaier 1
Session Chair: Kohei Cho
Session Chair: Uwe Soergel

Keynote: ARGOS, a Geosynchronous SAR Satellite to Observe Land, Ice, Hydrosphere and Atmosphere

Ramon Hanssen
TU Delft, Netherlands, The

Seasonal Comparison of Velocity of The Eastern Tributary Glaciers, Amery Ice Shelf, Antarctica, Using Sar Offset Tracking

Shridhar D. Jawak[1], Shubhang Kumar[2], Alvarinho J. Luis[3], Prashant H. Pandit[4], Sagar F. Wankhede[3], Anirudh Tharaventhedath Somadas[5]
[1]Svalbard Integrated Arctic Earth Observing System (SIOS), SIOS Knowledge Centre, University Centre in Svalbard (UNIS), Norway; [2]Central University of Jharkhand, Ranchi, India; [3]Earth System Science Organization- National Centre for Polar and Ocean Research, Ministry of Earth Sciences, India; [4]National Bureau of Soil Survey and Land Use planning (NBSS & LUP) - Indian Agriculture Research Institute (IARI), India; [5]University of Twente Faculty ITC, Netherlands

Validation of ASMR2 Sea Ice Concentration Data Using Modis Data

Kohei Cho, Ryohei Nagao, Kazuhiro Naoki
Tokai University, Japan

Investigations on Vertical Land Movements Along the North Sea and Baltic Sea Coast in Germany with PS Interferometry

Anika Riedel, Bjoern Riedel, Dieter Tengen, Markus Gerke
Institute of Geodesy and Photogrammetry, Technische Universität Braunschweig, Germany

PRSM-05: Chang'E-4 Mission

Time: Friday, 14/Jun/2019: 9:00am - 10:30am · *Location:* Waaier 3
Session Chair: Jürgen Oberst
Session Chair: Bo Wu

Topographic Analysis of Chang'e-4 Landing Site Using Orbital, Descent and Ground Data

Kaichang Di[1], Zhaoqin Liu[1], Bin Liu[1], Wenhui Wan[1], Man Peng[1], Jian Li[2], Jianfeng Xie[2], Mengna Jia[1], Shengli Niu[1], Xin Xin[1], Lichun Li[2], Jia Wang[2], Zongyu Yue[1], Sheng Gou[1], Yexin Wang[1], Runzhi Wang[1], Jia Liu[1], Zheng Bo[1], Chuankai Liu[2], Tianyi Yu[2], Luhua Xi[2], Yi Miao Miao[2]

[1]Institute of Remote Sensing and Digital Earth Chinese Academy of Sciences, China, People's Republic of; [2]Beijing Aerospace Control Center, Beijing, China

High Precision DTM and DOM Generating Using Multi-Source Orbital Data on Chang'e-4 Landing Site

Bin Liu, Shengli Niu, Xin Xin, Mengna Jia, Kaichang Di, Zhaoqin Liu, Man Peng, Zongyu Yue

Institute of Remote Sensing and Digital Earth Chinese Academy of Sciences, China, People's Republic of

Descent and Landing Trajacetory Recovery Of Chang'e-4 Lander Based on Decenst Images

Wenhui Wan[1], Zhaoqin Liu[1], Bin Liu[1], Kaichang Di[1], Jia Wang[2], Chuankai Liu[2], Tianyi Yu[2], Yi Miao[2], Man Peng[1], Yexin Wang[1], Sheng Gou[1]

[1]Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences; [2]Beijing Aerospace Control Center

Potential Geologic Issues of Von Kármán Crater Revealed by Multisource Remote Sensing Data

Zhiguo Meng[1,2,3], Huihui Wang[1], Shengbo Chen[1], Jinsong Ping[3], Qian Huang[4], Zhanchuan Cai[2], Yunzhao Wu[5], Lixin Xing[1], Yangang Wu[1]

[1]Jilin University, China, People's Republic of; [2]Macau University of Science and Technology, Macau; [3]National Astronomical Observatory of CAS, China, People's Republic of; [4]China University of Geosciences, China, People's Republic of; [5]Purple Mountain Observatory, Chinese Academy of Sciences, China

Closing PRSM

Bo Wu

The Hong Kong Polytechnic University

C3MGBD-04: Crowdsourced and VGI Data I

Time: Friday, 14/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 4
Session Chair: Cidália Costa Fonte
Session Chair: Serena Coetzee

Volunteer Geographic Information in Africa

Aster Denekew Yilma
United Nations Economic Commission for Africa, Ethiopia

Traffic Event Detection Using Twitter Data Based on Association Rules

Shishuo Xu[1,2], Songnian Li[1], Richard Wen[1], Wei Huang[3]
[1]Department of Civil Engineering, Ryerson University, 350 Victoria St., Toronto, ON M5B 2K3, Canada; [2]School of Environment Science and Spatial Informatics, China University of Mining and Technology, No. 1 Daxue Road, Xuzhou, Jiangsu 221116, China; [3]Ministry of Transportation Ontario, 777 Bay St., Toronto, ON M7A 2J3, Canada

Towards Establishing an Open Catalogue for Geospatial Educational Resources

Victoria Rautenbach[1], Serena Coetzee[1], Arzu Coltekin[2], Chris Pettit[3], Lauren Pijper[1], Marguerite Madden[4], Sidonie Christophe[5], Ochiroo Lkhamjav[6]
[1]University of Pretoria, South Africa; [2]University of Applied Sciences Northwestern Switzerland, Switzerland; [3]UNSW, Australia; [4]University of Georgia Athens, Georgia, USA; [5]IGN-France, Paris, France; [6]Mongolian Geospatial Association Ulaanbaatar, Mongolia

Monitoring SDG 9 with Global Open Data and Open Software - A Case Study from Rural Tanzania

Codrina Ilie[1], Maria Brovelli[2], Serena Coetzee[3]
[1]Technical University of Civil Engineering of Bucharest, Bucharest, Romania; [2]Politecnico di Milano, Italy; [3]University of Pretoria, South Africa

Using and Improving Mapathon Data Through Hackathons

Serena Coetzee[1], Victoria Rautenbach[1], Cameron Green[1], Kiev Gama[2], Nicolene Fourie[3], Breno Goncalves[2], Nishanth Sastry[4]
[1]Centre for Geoinformation Science, Department of Geography, Geoinformatics and Meteorology, University of Pretoria, South Africa; [2]Federal University of Pernambuco (UFPE), Brazil; [3]Council for Scientific and Industrial Research, South Africa; [4]King's College London, Great Britain

CHGCS-01: The Changing Cryosphere I

Time: Friday, 14/Jun/2019: 11:00am - 12:30pm · *Location:* Carré 2K
Session Chair: Rongxing Li
Session Chair: Hansheng Wang

Ice Sheet Elevation Mapping and Change Detection with the Ice, Cloud and Land Elevation Satellite-2

Beata Maria Csatho[1], Anton Franz Schenk[1], Thomas Neumann[2]
[1]University at Buffalo, Buffalo, NY, United States of America; [2]NASA Goddard Space Flight Center, Greenbelt, MD, United States of America

Mass Balance of Antarctic Ice Sheet from 2003 to 2008: A Systematically Improved New Estimation

Rongxing Li[1,2], Huan Xie[1,2], Yixiang Tian[1,2], Wenjia Du[1,2], Jiajin Chen[1,2], Gang Hai[1,2], Shanshan Zhang[1,2], Xiaohua Tong[1,2]
[1]Center for Spatial Information Science and Sustainable Development Applications, Tongji University, Shanghai; [2]College of Surveying and Geo-Informatics, Tongji University, Shanghai

Noise Reduction and Interpretation of Ice-Penetrating Radar Data in Antarctic Ice Sheet based on Variational Mode Decomposition

Xueyuan Tang, Siyuan Cheng, Jingxue Guo
Polar Research Institute of China, China, People's Republic of

Preliminary Results of Sea Ice Freeboard Measurements of Beaufort Sea From Cryosat-2 Altimetry

Shengkai Zhang, Yaowen Zuo, Feng Xiao, Lexian Yuan, Tong Geng, Yue Xuan
Wuhan University, China, People's Republic of

Ice Flow Velocity Mapping of East Antarctica from 1963 to 1989

YUAN CHENG[1,2], XUEWEI LI[1,2], GANG QIAO[1,2], WENKAI YE[1,2], YONG HUANG[1,2], YANJUN LI[1,2], KANGLE WANG[1,2], YIXIANG TIAN[1,2], XIAOHUA TONG[1,2], RONGXING LI[1,2]
[1]Center for Spatial Information Science and Sustainable Development, Tongji University, 1239 Siping Road, Shanghai, China; [2]College of Surveying and Geo-Informatics, Tongji University, 1239 Siping Road, Shanghai, China

COW-05: Calibration II

Time: Friday, 14/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 2
Session Chair: Michael Cramer
Session Chair: Naser El-Sheimy

Real-Time on-Orbit Calibration of Angles Between Star Sensor and Earth Observation Camera for Optical Surveying and Mapping Satellites

Wei Liu[1], Hui Wang[2], Weijiao Jiang[2], Fangming Qian[3], Leiming Zhu[4]
[1]Xi'an Research Institute of Surveying and Mapping, China, People's Republic of; [2]State Key Laboratory of Integrated Service Network, Xidian University, Xi'an, China; [3]Information Engineering University, Zhengzhou, China; [4]Centre of TH-Satellite of China, Beijing, China

Automatic Calibration and Co-Registration for a Stereo System and a Thermal Imaging Sensor using a Chessboard

Andre Choinowski, Dennis Dahlke, Ines Ernst, Sebastian Pless, Immanuel Rettig
German Aerospace Centre, Germany

Reliability of The Geometric Calibration of an Hyperspectral Frame Camera

Maria Angela Musci, Irene Aicardi, Paolo Dabove, Andrea Maria Lingua
Politecnico di Torino, Italy

Performance Evaluation of Sequential Band Orientation by Polynomial Models in Hyperspectral Cubes Collected with UAV

Adilson Berveglieri[1], Antonio M. G. Tommaselli[1], Guilherme Santos[1], Lucas D. Santos[1], Eija Honkavaara[2]
[1]Unesp - São Paulo State University, Brazil; [2]FGI - Finnish Geospatial Research Institute

Closing EuroCOW-M3DMaN

Michael Cramer
Universität Stuttgart, Germany

HYPER-01: Analysis of Hyperspectral Data

Time: Friday, 14/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 1
Session Chair: Eija Honkavaara
Session Chair: Martin Weinmann

Opening HyperMLPA

Martin Weinmann, Sina Keller
Karlsruhe Institute of Technology, Germany

Keynote: Deep Learning for the Processing of Hyperspectral Data: Over a Decade of History

Jocelyn Chanussot
Grenoble Institute of Technology, France

Soil Texture Classification with 1D Convolutional Neural Networks based on Hyperspectral Data

Felix M. Riese, Sina Keller
Karlsruhe Institute of Technology (KIT), Germany

A Hybridization of An Improved Particle Swarm Optimization and Fuzzy K-Means Algorithm for Hyperspectral Image Classification

Qiang Chen, Jie Jiang, Mingyi Du, Lei Zhou, Changfeng Jing, Chang Lu
Beijing University of Civil Engineering and Architecture, China, People's Republic of

SARCON-01: Monitoring and object detection

Time: Friday, 14/Jun/2019: 11:00am - 12:30pm · *Location:* Waaier 3
Session Chair: Michele Crosetto
Session Chair: Uwe Soergel

Workable Monitoring System based on Spaceborne SAR Images for Mining Areas - STINGS Development Project

Chia-Hsiang Yang[1], Andreas Müterthies[1], Uwe Soergel[2]
[1]EFTAS Remote Sensing Transfer of Technology, Germany; [2]Institute for Photogrammetry, University of Stuttgart, Germany

3D Estimation of Slow Ground Motion using InSAR and The Slope Aspect Assumption, A Case Study: The Puncak Pass Landslide, Indonesia

Noorlaila Isya[1,2], Wolfgang Niemeier[1], Markus Gerke[1]
[1]Institute of Geodesy and Photogrammetry, Technical University of Braunschweig, Germany; [2]Department of Geomatics Engineering, Sepuluh Nopember Institute of Technology, Indonesia

Radar Remote Sensing Applications in Landslide Monitoring with Multi-platform InSAR Observations: a Case Study from China

Tengteng Qu[1,2], Qiang Xu[2], Chun Liu[3], Zhenhong Li[4], Bo Chen[1], Keren Dai[2]
[1]College of Engineering, Peking University, Beijing 100871, China; [2]State Key Laboratory of Geohazard Prevention and Geoenviroment Protection, Chengdu University of Technology, Chengdu 610059, China; [3]College of Surveying and Geo-Informatics, Tongji University, Shanghai 200092, China; [4]COMET, School of Engineering, Newcastle University, Newcastle Upon Tyne NE1 7RU, UK

InSAR Analysis of Ayvacik 2017 (Mw 5.3) Earthquake Swarm (Çanakkale, Nw-Turkey)

Saygin Abdikan[1], Mumin Imamoglu[2], Tolga Alasag[2], Mustafa Toker[3], Senol Hakan Kutoglu[1], Sakir Sahin[4]
[1]Zonguldak Bulent Ecevit University, Turkey; [2]TÜBİTAK Bilgem, Turkey; [3]Yüzüncü Yıl University, Turkey; [4]Süleyman Demirel University, Turkey

Multiple-Point Geostatistics to Derive Missing Surface Displacement Values of A Glacier Inferred from Dinsar

Bhuwan Ranjit[1], Valentyn A. Tolpekin[2], Alfred Stein[2]
[1]Land Management Training Centre, Ministry of Land Management, Cooperatives and Poverty Alleviation, Dhulikhel, Kavrepalanchok, Nepal; [2]Dept. of Earth Observation Science, Faculty of Geo-Information Science and Earth Observation (ITC), University of Twente, Hengelostraat 99, 7514 AE Enschede, The Netherlands

PS-05: Poster session

Time: Friday, 14/Jun/2019: 1:30pm - 2:30pm · *Location:* Foyer

Application of Sentinel-1 SAR Imagery for Floods Damage Assessment: A Case Study of Nakhon Si Thammarat, Thailand

Gautam Dadhich, Hiroyuki Miyazaki, Mukand S Babel
Asian Institute of Technology, Thailand

PolInSAR Based Scattering Information retrieval for Forest Aboveground Biomass Estimation

Neeraj Agrawal[1], Shashi Kumar[2], Valentyn Tolpekin[3]
[1]Iora Ecological Solutions Pvt. Ltd., New Delhi, India; [2]Indian Institute of Remote Sensing, Dehradun, India; [3]Faculty of Geo-Information Science and Earth Observation (ITC), University of Twente, The Netherlands

Trajectory Extraction for Analysis of Unsafe Driving Behaviour

Christian Koetsier, Steffen Busch, Monika Sester
Leibniz University Hannover, Germany

DSM and DTM for Extracting 3D Building Models: Advantages and Limitations

Francesca Fissore[1,2], Francesco Pirotti[1,2]
[1]CIRGEO Interdepartmental Research Center of Geomatics, University of Padova, Italy; [2]TESAF Department, University of Padova, Italy

Exploring the Potential of Crowd Sourced Data to Map Commuter Points of Interest: a Case Study of Johannesburg

Thembani Moyo, Walter Musakwa
University of Johannesburg, South Africa

Geomatic Methods Applied to The Change Study of the La Paúl Rock Glacier, Spanish Pyrenees

Adrián Martínez-Fernández[1], Enrique Serrano[1], José Juan Sanjosé[2], Manuel Gómez-Lende[3], Alfonso Pisabarro[1], Manuel Sánchez[2]
[1]Dept. of Geography, University of Valladolid, Valladolid, Spain; [2]Dept. of Graphic Expression, Polytechnic School, University of Extremadura, Cáceres, Spain; [3]GIR PANGEA, University of Valladolid, Valladolid, Spain

Ground Point Filtering from Airborne Lidar Point Clouds Using Deep Learning: A Preliminary Study

Eric Janssens-Coron, Eric Guilbert
Department of Geomatics Sciences, Université Laval, Québec, Canada

The Vertical Land Motion of Tide Gauge and Absolute Sea Level Rise in Bohai Sea

Dongxu Zhou[1], Weikang Sun[1,2], Yanguang Fu[1,2], Xinghua Zhou[1,2]
[1]The First Institute of Oceanography, Ministry of Natural Resources, China, People's Republic of; [2]Shandong University of Science and Technology

Mapping Velocity of The Potsdam Glacier, East Antarctica Using Landsat-8 Data

Shridhar D. Jawak[1], Mansi Joshi[2,3], Alvarinho J. Luis[4], Prashant H. Pandit[5], Shubhang Kumar[6], Sagar F. Wankhede[4], Anirudh Tharaventhedath Somadas[7]
[1]Svalbard Integrated Arctic Earth Observing System (SIOS), SIOS Knowledge Centre, University Centre in Svalbard (UNIS), Norway; [2]Mangalore University, Mangalore, Karnataka, India; [3]Indian Institute of Science, Bangalore, Karnataka, India; [4]Earth System Science Organization- National Centre for Polar and Ocean Research, Ministry of Earth Sciences, India; [5]National Bureau of Soil Survey and Land Use planning (NBSS & LUP) - Indian Agriculture Research Institute (IARI), India; [6]Central University of Jharkhand, Ranchi, India; [7]University of Twente Faculty ITC, Netherlands

Evaluating Glacier Dynamics Using Temporal Remote Sensing Images: A Case Study of Hunza Valley, Northern Pakistan

Muhammad Shafique[1,2], Babar Faiz[1], Alamsher Bacha[1]
[1]National Centre of Excellence in Geology, University of Peshawar, Pakistan, Pakistan; [2]Faculty of Environmental Design, King Abdulaziz University, Kingdom of Saudi Arabia

Multi-Source Satellite Observations Reveal Evolution Pattern of Rifts in The Filchner-Ronne Ice Shelf, Antarctica

Rongxing Li[1,2], Da Lv[1,2], Haifeng Xiao[1,2], Shijie Liu[1,2], Yuan Cheng[1,2], Gang Hai[1,2], Xiaohua Tong[1,2]
[1]Center for Spatial Information Science and Sustainable Development Applications, Tongji University, Shanghai, China; [2]College of Surveying and Geo-Informatics, Tongji University, Shanghai, China

Application of Hyperspectral Thermal Emission Spectrometer (HyTES) data for HysplRI optimal Band Positioning to Characterize Surface Minerals

Saleem Ullah, Arshad Iqbal
Institute of Space Technology, Islamabad, Pakistan

Comparative Analysis of SVM, ANN and CNN for Classifying Vegetation Specie Using Hyperspectral Thermal Infrared Data

Mehmood ul Hasan, saleem ullah, muhammad jaleed khan, khurram khursid
Institute of Space Technology Islamabad, Pakistan

Feature Filtering and Selection for Dry Matter Estimation on Perennial Ryegrass: a Case Study of Vegetation Indices.

Gustavo Togeiro de Alckmin[1,2], Lammert Kooistra[2], Arko Lucieer[1], Richard Rawnsley[1,3]
[1]University of Tasmania, Australia; [2]Wageningen University; [3]Tasmanian Institute of Agriculture

Spectral Preprocessing for Hyperspectral Remote Sensing of Heavy Metals in Water

Mengshan Lee, Xin-Yu Chen, Hui-Chun Lee
National Kaohsiung University of Science and Technology, Taiwan

Comparision of Object Based Machine Learning Classifications of Planetscope and Worldview-3 Satellite Images for Land Use / Cover

Aylin Tuzcu, Gulsen Taskin, Nebiye Musaoğlu
Istanbul Technical University, Turkey

Classification of Tree Species on the Basis of Tree Bark Texture

Lene Ganschow[1], Tom Thiele[1], Niklas Deckers[2], Ralf Reulke[2]
[1]VINS 3D GmbH, Berlin, Germany; [2]HU-Berlin, Germany

C3MGBD-05: Crowdsourced and VGI Data II

Time: Friday, 14/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 2
Session Chair: Berk Anbaroglu
Session Chair: Paul Vincent Kuper

Database-Supported Change Analysis and Quality Evaluation of OpenStreetMap Data

Alexander Martini[1], Paul Vincent Kuper[2], Martin Breunig[2]
[1]Disy Informationssysteme GmbH; [2]Karlsruhe Institute of Technology (KIT)

Spatial Database Model for Mobility Management

Emere Arco[1], Andrea Ajmar[2], Piero Boccardo[1]
[1]Politecnico di Torino, Italy; [2]ITHACA Information Technology for Humanitarian Assistance, Cooperation and Action, Turin, Italy

Closing C3M&GBD

Maria Antonia Brovelli[1], Éric Guilbert[2]
[1]Politecnico di Milano, Italy; [2]Université Laval, Canada

CHGCS-02: Hydrosphere and Applications

Time: Friday, 14/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 4
Session Chair: Yinsheng Zhang
Session Chair: Marco Scaioni

Sea Level Trend and Variability in The South China Sea

Yanguang Fu[1,2], Xinghua Zhou[1,2], Dongxu Zhou[1], Weikang Sun[2], Chuanling Jiang[2]
[1]First Institute of Oceanography, Ministry of Natural Resources; [2]College of Geodesy and Geomatics, Shandong University of Science and Technology

Extraction of Rivers and Lakes on Tibetan Plateau Based on Google Earth Engine

R.G. Xu[1], G. Qiao[2], Y.J. Wu[3], Y.J. Cao[4]
[1]College of Surveying and Geo-Informatics, Tongji University, Siping Road 1239, Shanghai 200092, China; [2]College of Surveying and Geo-Informatics, Tongji University, Siping Road 1239, Shanghai 200092, China; [3]College of Surveying and Geo-Informatics, Tongji University, Siping Road 1239, Shanghai 200092, China; [4]College of Surveying and Geo-Informatics, Tongji University, Siping Road 1239, Shanghai 200092, China

Converse Trends of The Terrestrial and Ground Water Storage Changes in Canada and the United States

Hansheng Wang[1,2], Longwei Xiang[1], Holger Steffen[3], Patrick Wu[4], Liming Jiang[1], Qiang Shen[1], Dimitrios Piretzidis[5], Michael G. Sideris[5], Masaki Hayashi[4], Lulu Jia[6]
[1]State Key Laboratory of Geodesy and Earth's Dynamics, Institute of Geodesy and Geophysics, Chinese Academy of Sciences, Wuhan 430077, China; [2]University of Chinese Academy of Sciences, Beijing 100049, China; [3]Lantmäteriet, 80182 Gävle, Sweden; [4]Department of Geoscience, University of Calgary, Calgary T2N 1N4, Canada; [5]Department of Geomatics Engineering, University of Calgary, Calgary T2N 1N4, Canada; [6]National Earthquake Infrastructure Service, Beijing 100036, China

HYPER-02: Land Cover and Land Use Classification

Time: Friday, 14/Jun/2019: 2:30pm - 3:30pm · *Location:* Waaier 1
Session Chair: Rupert Müller
Session Chair: Sina Keller

Fusion of Hyperspectral, Multispectral, Color and 3D Point Cloud Information for the Semantic Interpretation of Urban Environments

Martin Weinmann[1], Michael Weinmann[2]
[1]Karlsruhe Institute of Technology, Germany; [2]University of Bonn, Germany

Land Use and Land Cover Classification Using Hyperspectral Imagery: Evaluating the Performance of Spectral Angle Mapper, Support Vector Machine and Random Forest Classifiers

Luiz Eduardo Christovam, Guilherme Gomes Pessoa, Milton Hirokazu Shimabukuro, Maria de Lourdes Bueno Trindade Galo
São Paulo State University, School of Sciences and Technology, Presidente Prudente, SP, Brazil

Comparison of Pixel and Region-Based Approaches for Tree Species Mapping in Atlantic Forest Using Hyperspectral Images Acquired by UAV

Gabriela Takahashi Miyoshi[1], Nilton Nobuhiro Imai[1], Antonio Maria Garcia Tommaselli[1], Eija Honkavaara[2]
[1]São Paulo State University, Brazil; [2]Finnish Geospatial Research Institute FGI, Finland

SARCON-02: Urban areas

Time: Friday, 14/Jun/2019: 2:30pm - 3:45pm · *Location:* Waaier 3
Session Chair: Uwe Soergel
Session Chair: Michele Crosetto

A Persistent Scatterer Interferometry Procedure to Monitor Urban Subsidence

Michele Crosetto[1], Oriol Monserrat[1], Anna Barra[1], María Cuevas-González[1], Vrinda Krishnakumar[1], Marek Mróz[2], Bruno Crippa[3]
[1]Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Division of Geomatics, Spain; [2]Institute of Geodesy, University of Warmia and Mazury in Olsztyn, Poland; [3]University of Milan, Department of Earth Sciences, Italy

Monitoring the Surface Subsidence of Handan City Using Sentinel-1A Images and SBAS-InSAR Technology

Guoman Huang[1,2], Huan Chen[1,2], Xi Li[1,2], Guoqi Cheng[1,2], Zhigang Yu[1,2], Haiyan Gu[2]
[1]College of Geomatics, Shandong University of Science and Technology, Qingdao 266590, China; [2]Key Laboratory of Geo-Informatics of State Bureau of Surveying and Mapping, Chinese Academy of Surveying and Mapping, 100830 Beijing, China

Evaluation of A PSI-Based Change Detection Regarding Simulation, Comparison, and Application

Chia-Hsiang Yang, Uwe Soergel
Institute for Photogrammetry, University of Stuttgart, Germany

Closing SarCon

Uwe Soergel[1], Michele Crosetto[2]
[1]Universität Stuttgart, Germany; [2]CTTC, Spain

HYPER-03: Environmental Mapping

Time: Friday, 14/Jun/2019: 4:00pm - 5:30pm · *Location:* Waaier 1
Session Chair: Ralf Reulke
Session Chair: Martin Weinmann

Detecting Citrus Huanglongbing in Brazilian Orange Orchard Using Hyperspectral Aerial Images

Érika Akemi Saito Moriya[1,4], Nilton Nobuhiro Imai[1], Antonio Maria Garcia Tommaselli[1], Adilson Berveglieri[1], Eija Honkavaara[2], Márcio Augusto Soares[3], Marcelo Marino[3]
[1]Unesp, Brazil; [2]Finnish Geodetic Institute; [3]Agroterenas; [4]Fundunesp

Estimating Chlorophyll A Concentrations of Several Inland Waters with Hyperspectral Data and Machine Learning Models

Philipp M. Maier, Sina Keller
Karlsruhe Institute of Technology, Germany

The Superspectral/Hyperspatial Worldview-3 as The Link Between Spaceborne Hyperspectral and Airborne Hyperspatial Sensors: The Case Study of The Complex Tropical Coast

Antoine Collin[1,2], Mark Andel[3], Dorothée James[1], Joachim Claudet[2,4]
[1]EPHE, PSL Université Paris, 35800 Dinard, France; [2]LabEx CORAIL, Moorea, French Polynesia; [3]DigitalGlobe Foundation, 80234 Westminster, Colorado, USA; [4]National Center for Scientific Research, PSL Université Paris, CRIOBE, 75005 Paris, France

Closing HyperMLPA

Martin Weinmann, Sina Keller
Karlsruhe Institute of Technology, Germany

CHGCS-03: The Changing Cryosphere II

Time: Friday, 14/Jun/2019: 4:00pm - 5:45pm · *Location:* Waaier 4
Session Chair: Beata Maria Csatho
Session Chair: Gang Qiao

Monitoring Sub-Weekly Evolution of Surface Velocity and Elevation for a High-Latitude Surging Glacier Using Sentinel-2

Bas Altena, Odin Næss Haga, Christopher Nuth, Andreas Kääb
University of Oslo, Norway

Investigation on Mountain Glacier Ice Storage and its Changes during 2000-2016 Combine Ground and Satellite Observation in Western Tibetan Plateau

Yinsheng Zhang, Xiaojuan Zou, Haifeng Gao
Institute of Tibetan Plateau Research, Chinese Academy of Sciences, China

Remote Sensing of Global Monthly Evapotranspiration with an Energy Balance (EB) Model

Xuelong Chen[1], Bob Su[2], Yaoming Ma[1]
[1]Institute of Tibetan Plateau Research, Chinese Academy of Sciences, Beijing, China,; [2]Faculty of Geo-Information Science and Earth Observation, University of Twente,

Monitoring alpine Glaciers from Close-range to Satellite Sensors

Vasil Yordanov[1], Davide Fugazza[2], Roberto Azzoni[2], Massimo Cernuschi[3], Marco Scaioni[4], Guglielmina Adele Diolaiuti[2]
[1]Dept. "A. Desio", University of Milan, Italy; [2]Dept. of Environmental Science and Policy, University of Milan, Italy; [3]c Agricola 2000 S.C.P.A, Milan, Italy; [4]Dept. of Architecture, Built Environment and Construction Engineering, Politecnico di Milano, Italy

Deformation Monitoring of High-Latitude Permafrost Region of Northeastern China with Time Series InSAR Technique

Tengteng Qu[1,2], Qiang Xu[2], Wei Shan[3], Zhenhong Li[4], Monan Shan[5], Keren Dai[2]
[1]College of Engineering, Peking University, Beijing 100871, China; [2]State Key Laboratory of Geohazard Prevention and Geoenviroment Protection, Chengdu University of Technology, Chengdu 610059, China; [3]Institute of Cold Regions Science and Engineering, Northeast Forestry University, Harbin, China; [4]COMET, School of Engineering, Newcastle University, Newcastle Upon Tyne NE1 7RU, UK; [5]Department of Earth Sciences, University of Florence, Firenze, Italy

Closing CHCGS

Rongxing Li
Tongji University, China