2021 digital edition - XXIVth ISPRS Congress Programme (June 17, 2021)

All hours provided in this document are Central European Summer Time (CEST / GMT + 2).

Monday 5 July

08:00 - 08:50: *Spatial Analysis* (Technical Commission IV)
Chairpersons: Mahmoud Delavar and Wu Hao
- MO.1.1: #374 *A framework to manage uncertainty in the computation of waste collection routes after a flood.* **Arnaud Le Guilcher**, Sofiane Martel, Mickaël Brasebin, Yann Méneroux.
- MO.1.2: #404 *Remote sensing analysis of the changes in vegetated coastland: the case of Southeastern Europe*. **Kuenda Laze**.
- MO.1.3: #313 *On the visualization of positional precision*. **Jochen Meidow**.
- MO.1.4: #487 *An improved temperature spatial interpolation method for spaceborne lidar atmospheric correction.* Mei Zhou, Kuangyu Li, **Miaomiao Pan**, Jiuying Chen, Chuanrong Li, Linsheng Chen.

09:00 - 09:50: *Advanced applications for Smart Cities* (Technical Commission IV)
Chairpersons: Giorgio Agugiaro and Margarita Kokla
- MO.2.1: #282 *Volume comparison of automatically reconstructed multi-LoD building models for urban planning applications*. **Truc Quynh Doan**, Camilo León Sánchez, Ravi Peters, Giorgio Agugiaro, Jantien Stoter.
- MO.2.2: #797 *Development of 3D cadastre in New South Wales though e-PLAN logement.* Taha Masri, **Dev Raj Paudyal**.
- MO.2.3: #238 *Accuracy investigation on image-based change detection for BIM compliant indoor models*. Theresa Meyer, Ansgar Brunn, Uwe Stilla.
- MO.2.4: #395 *Augmented reality asset tracking using hololens.* Jihai Fan, Kourosh Khoshelham.

10:00 - 10:50: *Thematic Information Extraction* (Technical Commission III)
Chairperson: Xinlian Liang

- MO.3.1: #279 *Towards fine-grained road maps extraction using sentinel-2 imagery.* **Christian Ayala**, Carlos Aranda, Mikel Galar.
- MO.3.2: #620 *Towards Detecting Floating Objects on a Global Scale with Learned Spatial Features using Sentinel-2*. **Jamila Mifdal**, Nicolas Longépé, Marc Rußwurm.
- MO.3.3: #596 *Germany's first cloud-based web service for land monitoring using Copernicus Sentinel-2 data.* **Patrick Werner Knoefel**, David Herrmann, Marcus Sindram, Michael Hovenbitzer.

- MO.3.4: #767 *Estimating carbon and greenhouse gas emissions in remote regions of Canada.* **Ima Ituen**, Baoxin Hu.

11:00 - 11:30: Technology Track
Günther Landgraf (European Space Agency). *The ESA Earth Observation platforms to leverage open science and pioneer innovative applications.*

11:00 - 11:50: *Active Remote Sensing* *(Technical Commission III)*
Chairperson: Batuhan Osmanoglu

- MO.4.1: #444 *Using generative adversarial networks for extraction of InSAR signals from large-scale Sentinel-1 interferograms by improving tropospheric noise correction.* **Binayak Ghosh**, Mahmud Hagshenas Haghighi, Mahdi Motagh, Setareh Maghsudi.
- MO.4.2: #635 *UAV-based Lidar high-resolution snow depth mapping in the Swiss Alps: Comparing flat and steep forests.* **Kalliopi Koutantou**, Giulia Mazzotti, Philip Brunner.
- MO.4.3: #628 *Exploring cloud-based platforms for rapid InSAR time series analysis.* **Andreas Piter**, Magdalena Vassileva, Mahmud Haghshenas Haghighi, Mahdi Motagh.
- MO.4.4 : #340 *Investigation of Sentinel-1 time series for sensitivity to fern vegetation in a European temperate forest.* **Marlin M. Mueller**, Clémence Dubois, Thomas Jagdhuber, Carsten Pathe, Christiane Schmullius.

12:00 - 12:30: Opening and award ceremony.
Chairperson: Laurent Polidori

- **Welcome message.** Laurent Polidori (SFPT), Christian Heipke (ISPRS President), Nicolas Paparoditis (Congress Director)
- **The Frederick J. Doyle Award**. Christian Heipke, Armin Grün.
  Recipient: Konrad Schindler.

12:30 - 13:30: Keynote Speaker #1
Chairperson: Laurent Polidori

- **Emmanuel Flory (Airbus).** *Pléiades Neo 30cm-resolution satellite constellation : enhanced data access and geospatial application.*

13:30 - 14:15: Interactive poster session #1 (IPS.MO.1)
The list of posters scheduled for this session are provided at the end of this document.

14:15 - 15:00: Interactive poster session #2 (IPS.MO.2)
The list of posters scheduled for this session are provided at the end of this document.

15:15 - 16:15: Keynote Speaker #2
Chairperson: Nicolas Paparoditis

- **The Karl Kraus Medal.** Emmanuel Baltsavias, Julius Ernst, Uwe Sörgel, Christian Heipke.
  Recipients: Wolfgang Förstner, Bernhard Wrobel.
- **Claudio Almeida (INPE, Brazil).** *Vegetation monitoring in Brazilian biomes. Legacies, challenges and future perspectives.*

Laurent Gabet, Hervé Poilvé, Laurent Coeurdevey (Airbus). *Introduction of Pléiades Néo images and technical specifications. First technical experiments on Pléiades Néo images.*

16:30 - 17:20: *Sensor Calibration*   (Technical Commission I)
Chairpersons: Jan Skaloud, Francesco Nex
- MO.5.1: #408 *Mounting calibration of a multi-view camera system on a UAV platform.* **Mehrnoush Mohammadi**, Arman Khami, Franz Rottensteiner, Ingo Neumann, Christian Heipke.
- MO.5.2: #642 *Adaptive weighting of image observations for self-calibration with fisheye images.* **Letícia Ferrari Castanheiro**, Antonio Maria Garcia Tommaselli, Mariana Batista Campos, Adilson Berveglieri.
- MO.5.3: #741 *A review of the one-parameter division undistortion model.* **Bastian Erdnuess.**
- MO.5.4: #551 *Sentinel-2 Surface Reflectance Products Generated By CNES And DLR: Methods, Validation And Applications.* **Olivier Hagolle**, Jérome Colin, Sophie Coustance, Peter Kettig, Pablo d'Angelo, Stefan Auer, Georgia Doxani, Camille Desjardins.

17:30 - 18:20: *Object Monitoring in Remote Sensing*   *(Technical Commission I)*
Chairpersons: Michael Schmitt, Rupert Müller
- MO.6.1: #168 *Extraction of Cloud Heights from Sentinel-2 Multispectral Images.* **Thomas Krauß**.
- MO.6.2: #166 *Thermal anomaly detection based on saliency analysis from multimodal imaging sources.* **Artuom Sledz**, Christian Heipke.
- MO.6.3: #598 *Evaluating uniform manifold approximation and projection for dimension reduction and visualization of PolInSAR features.* **Sylvia Schmitz**, Uwe Weidner, Horst Hammer, Antje Thiele.
- MO.6.4: #419 *Convolutional neural networks for detecting bridge crossing events with ground-based interferometric radar data.* **Matthias Arnold**, Mareike Hoyer, Sina Keller.

18:30 - 19:20: *Mobile Mapping*   *(Technical Commission I)*
Chairpersons: Naser El-Sheimy, Stephan Nebiker
- MO.7.1: #373 *Fixed-wing micro UAV open data with digicam and raw INS/GNSS.* **Jan Skaloud**, Davide Antonio Cucci, Kenneth Joseph Paul.
- MO.7.2: #297 *RADLER - A Unicycle as a Low-cost Radial Laser Scanner.* **Dorit Borrmann**, Sven Jörissen, Andreas Nüchter.
- MO.7.3: #423 *3D Modeling and GIS analysis for aerodrome forest obstacle monitoring.* **Liudmila Mitsevich**, Natalia Zhukovskaya.
- MO.7.4: #667 *Curiosity-driven reinforcement learning agent for mapping unknown indoor environments.* **Nicolò Botteghi**, Rob Schulte, Beril Sirmacek, Mannes Poel, Christoph Brune.

08:00 - 08:50: *Data integration*   *(Technical Commission IV)*
Chairpersons: Zhizhong Kang, Arzu Cöltekin

- TU.1.1: #694 *Region adaptive adjustment strategy based on information entropy for remote sensing image segmentation*. Xiaoli Li, Jinsong Chen.
- TU.1.2: #100 *Classification and identification of artificial lakes based on national geographic-conditions data*. Zhiwu Zhou, Shengyuan Jing, Yinxi Gong, Hui Zhao.
- TU.1.3: #801 *Combining terrestrial scanned datasets with UAV point cloud for mining operations*. Megan Fotheringham, Dev Raj Paudyal.
- TU.1.4: #451 *A platform for multilayered documentation of cultural heritage*. **Marko Radanovic**, Kourosh Khoshelham, Clive Fraser.

09:00 - 09:50: *Data processing and simulation*   *(Technical Commission IV)*
Chairpersons: Maria Brovelli and Martin Breunig

- TU.2.1: #259 *A two-level approach for the crowd-based collection of vehicles from 3D point clouds*. Volker Walter, Michael Koelle, David Collmar, Yongxiang Zhang.
- TU.2.2: #644 *Point cloud based 3D models for agent-based simulation in social distancing and evacuation*. **Shayan Nikoohemat**, Paula Godoy, Nienke Valkhoff, Marlies Wouters, Robert Voute, Ville Lehtola.
- TU.2.3: #242 *An experimental analysis of spatial indexing algorithms for real-time safety-critical map application*. Furkan Cetin, M.Oguzhan Kulekci.
- TU.2.4: #466 *Detection of the spatial variations of local populations from the viewpoint of urban structure analysis*. Kiichiro Kumagai, Yuki Kameda.

10:00 - 10:20: Technology Track

Martin Pfennigbauer (Riegl). *UAV-borne bathymetric lidar put to test.*

10:00 - 10:50: *Surface Modelling*   *(Technical Commission III)*
Chairpersons: Uwe Soergel, Kaichang Di

- TU.3.1: #214 *Segmentation of buildings based on high resolution persistent scatterer point clouds.* **Philipp Schneider**, Uwe Soergel.
- TU.3.2: #686 *Further adventures in Mars DTM quality: Smoothing errors, sharpening details.* **Randolph L. Kirk**, David P. Mayer, Bonnie L. Redding, Donna M. Galuszka, Robin L. Fergason, Trent M. Hare, Klaus Gwinner.
- TU.3.3: #630 *3D multi-resolution mapping of Mars using CASP-GO on HRSC, CRISM, CTX and HiRISE.* **Jan-Peter Muller**, Yu Tao, Alfiah Ritzky Diana Putri, Susan Conway.
- TU.3.4: #266 *Evaluating an Automated Object-Oriented Method to Delineate Drumlins from both Terrestrial and Submarine Digital Elevation Models.* **Kakoli Saha**, Katrien J.J. Van Landeghem.

11:00 - 12:00: Technology Track

- **Marc Spigai (Thalès Alenia Space).** *DeeperVision: an artificial intelligence powered computer vision facility performing automatic feature detection from satellite images.*

- **Frédéric Vallois (Thalès Alenia Space).** *WEkEO: an operational EUMETSAT, ECMWF, and MERCATOR Ocean DIAS for Copernicus data easy only access and processing.*
- **Frédéric Férésin (Thalès Alenia Space).** *In-space image processing using AI embedded on system on module: example of OPS-SAT cloud segmentation.*

11:00 - 11:50: *Hyperspectral Image Processing and Data Fusion (Technical Commission III)*
Chairpersons: Eija Honkavaara and Baoxin Hu

- TU.4.1: #799 *Piecewise anomaly detection using minimal learning machine for hyperspectral images.* **Anna-Maria Raita-Hakola**, Ilkka Pölönen.
- TU.4.2: #530 *Detection of methane plumes in hyperspectral images from Sentinel-5p by coupling anomaly detection and pattern recognition.* **Elyes Ouerghi**, Thibaud Ehret, Carlo de Franchis, Gabriele Facciolo, Thomas Lauvaux, Enric Meinhardt, Jean-Michel Morel.
- TU.4.3: #539 *Analysis and detection of wildfires by using PRISMA hyperspectral imagery.* **Dario Spiller**, Luigi Ansalone, Stefania Amici, Alessandro Piscini, Pierre Philippe Mathieu.
- TU.4.4: #401 *Marrying deep learning and data fusion for accurate semantic labeling of sentinel-2 images.* **Guillemette Fonteix**, Michael Swaine, Maxime Leras, Yuliya Tarabalka, Sébastien Tripodi, Frédéric Trastour, Anne Giraud, Lionel Laurore, Justin Hyland.

12:30 - 13:30: Keynote Speaker #3
Chairperson: Chen Jun
- **The U.V. Helava Award.** K. Neumann, Kostas Bischiniotis, Christian Heipke. <u>*Recipients*</u>*: Davide Cucci, Martin, Rehak, Jan Skaloud.*
- **Kiran Kumar (ISRO, India).** *Collection of scientific data of the Moon with the Chandrayaan satellites.*

13:30 - 14:15: Interactive poster session #3 (IPS.TU.1)
   The list of posters scheduled for this session are provided at the end of this document.

14:15 - 15:00: Interactive poster session #4 (IPS.TU.2)
   The list of posters scheduled for this session are provided at the end of this document.

15:15 - 16:15: Keynote Speaker #4
Chairperson: Christian Heipke
- **The Jack Dangermond Award.** Lawrence Jordan, Agata Kołomańska, Lena Halounova. <u>*Recipients*</u>*: Florent Poux, Roland Billen.*
- **Marc Pollefeys (ETH Zürich & Microsoft, Switzerland).** *Computer Vision for Mixed Reality with Hololens2.*

16:30 - 16:50: Technology Track
Roger Thomas (GeoDyn). *Rapid scanning of aerial film archives with PromptSCAN.*

16:30 - 17:20: *3D Change Detection* _(Technical Commission II)_
Chairperson: Belén Riveiro
- TU.5.1: #206 *Automatic point cloud segmentation for the detection of alterations on historical buildings through an unsupervised and clustering-based machine learning approach.* **Antonella Musicco**, Rosella Alessia Galantucci, Silvana Bruno, Cesare Verdoscia, Fabio Fatiguso.
- TU.5.2: #518 *Influence of spatial and temporal resolution on time series-based coastal surface change analysis using hourly terrestrial laser scans*. **Katharina Anders**, Lukas Winiwarter, Hubert Mara, Roderik Lindenbergh, Sander E. Vos, Bernhard Höfle.
- TU.5.3: #645 *Automated and permanent long-range terrestrial laser scanning in a high mountain environment: setup and first results from error identification*. **Annelies Voordendag**, Brigitta Goger, Christoph Klug, Rainer Prinz, Martin Rutzinger, Georg Kaser.
- TU.5.4: #307 *Change detection of time-series 3d point clouds using robust principal component analysis*. **Takashi Fuse**, Toshiki Yamano.

17:30 - 17:50: Technology Track
Dmitry Semyonov (Agisoft). *Terrestrial laser scanning data processing in Agisoft Metashape.*

17:30 - 18:20: *3D Instance Detection* _(Technical Commission II)_
Chairperson: Michael Ying Yang
- TU.6.1: #499 *Fast Weakly Supervised Detection of Railway-Related Infrastructures in LiDAR Acquisitions*. **Stéphane Guinard**, Jean-Philippe Riant, Jean-Christophe Michelin, Sofia Costa D'Aguiar.
- TU.6.2: #735 *A Framework for Generic Spatial Search in 3D Point Clouds*. **Johannes Otepka**, Gottfried Mandlburger, Wilfried Karel, Bruno Wöhrer, Camillo Ressl, Norbert Pfeifer.
- TU.6.3: #542 *Roadside tree extraction and diameter estimation with MMS LiDAR by using point-cloud image*. **Genki Takahashi**, Hiroshi Masuda.
- TU.6.4: #322 *Segmentation of traffic signs from poles with mathematical morphology applied to point clouds*. **Jesús Balado**, Mario Soilán, Lucía Díaz-Vilariño, Peter van Oosterom.

18:30 - 19:20: *3D Semantic Segmentation* _(Technical Commission II)_
Chairperson: Norbert Haala
- TU.7.1: #790 *Weakly supervised pseudo-label assisted learning for als point cloud semantic segmentation*. **Puzuo Wang**, Wei Yao.
- TU.7.2: #298 *Towards Mesh-Based Deep Learning for Semantic Segmentation in Photogrammetry*. **Manuel Knott**, Rick Groenendijk.
- TU.7.3: #188 *Which 3D data representation does the crowd like best? Crowd-based active learning for coupled semantic segmentation of point clouds and textured meshes*. **Michael Kölle**, Dominik Laupheimer, Volker Walter, Norbert Haala, Uwe Soergel.
- TU.7.4: #111 *Tesserae3D: A benchmark for tesserae semantic segmentation in 3D point clouds*. **Abderrazzaq Kharroubi**, Line Van Wersh, Roland Billen, Florent Poux.

Wednesday 7 July

08:00 - 08:50: *Education and Outreach*   *(Technical Commission V & Youth Forum)*
Chairpersons: Senthil Kumar, Sheryl Rose Reyes
- WE.1.1: #633 *Creative strategies in navigating the new normal: advancing the contributions of the ISPRS Student Consortium as an international organization.* **Sheryl Rose Reyes**, Charmaine Cruz, Mustafa Ustuner, Sona Guliyeva, Charles Jjuuko.
- WE.1.2: #424 *A webgis framework for semi-automated geodatabase updating assisted by deep learning.* **Recep Can**, Sultan Kocaman, Ali Ozgun Ok.
- WE.1.3: #152 *Regression analysis of errors of SAR-based DEMs and controlling factors.* **Yen-Yi Wu**, Hsuan Ren.
- WE.1.4: #538 *Towards gender equality in education and career in the Earth observation and GI sector.* **Barbara Riedler**, Nathalie Stéphenne, Estefanía Aguilar-Moreno, Marie Jagaille, Aida Monfort-Muriach, Grazia Fiore, Natassa Antoniou.

09:00 - 09:50: *Landuse and Landcover Change Detection*   *(Technical Commission III)*
Chairperson: Ammatzia Peled
- WE.2.1: #547 *Adversarial discriminative domain adaptation for deforestation detection.* **Javier Noa Turnes**, Pedro Juan Soto Vega, Gilson Alexandre Ostwald Pedro Costa, Dennis Wittich, Raul Queiroz Feitosa, Franz Rottensteiner.
- WE.2.2: *#356 Contribution index of land cover and land surface temperature changes in upper hill Nairobi, Kenya.* **Patricia Wanjiku Mwangi**, Faith Njoki Karanja, Peter Kariuki Kamau, Sammy Letema.
- WE.2.3: #393 *Investigations on feature similarity and the impact of training data for land cover classification.* **Mirjana Voelsen**, Daliana Lobo Torres, Raul Queiroz Feitosa, Franz Rottensteiner, Christian Heipke.
- WE.2.4: #365 *Graph Neural Network Based Multi-feature Fusion for Building Change Detection.* **Wei Yuan**, Xiuxiao Yuan, Zipei Fan, Zhiling Guo, Xiaodan Shi, Jianya Gong, Ryosuke Shibasaki.

10:00 - 10:30: Technology Track
Richard Goodman (Hexagon). *Grow with the flow: scale as needed with Spatial Modeler.*

10:00 - 10:50: *Application of Remote Sensing Data*   *(Technical Commission III)*
Chairpersons: Mitsunori Yoshimura, Fazlay S. Faruque
- WE.3.1: #112 *Estimation of Land Surface Albedo from GCOM-C/SGLI Surface Reflectance.* **Junichi Susaki**, Hiroaki Sato, Amane Kuriki, Koji Kajiwara, Yoshiaki Honda.
- WE.3.2: #380 *Estimation of optimal crown coverage and canopy shape for shadow estimation on tropical moist broadleaf forest.* **Takumi Fujiwara**, Wataru Takeuchi.
- WE.3.3: *#325 Automated building segmentation and damage assessment from satellite images for disaster relief.* **Xiangtian Yuan**, Seyed Majid Azimi, Corentin Henry, Veronika Gstaiger, Marco Codastefano, Michael Manalili, Stefano Cairo, Sirio Modugno, Marc Wieland, Anne Schneibel, Nina Merkle.
- WE.3.4: #726 *Evaluating the impact of LaSRC and Sen2cor atmospheric correction algorithms on Landsat-8/OLI and Sentinel-2/MSI data over AERONET stations in Brazilian*

territory. **Rennan de Freitas Bezerra Marujo**, José Guilherme Fronza, Anderson Reis Soares, Gilberto Ribeiro de Queiroz, Karine Reis Ferreira.

10:45 - 12:15: Technology Track
- **Lawrie Jordan, Peter Becker, Delphine Khanna (ESRI).** *Hands-on resources for learning imagery & remote sensing with ArcGIS.*
- **Peter Becker (ESRI).** *ArcGIS for image management, mapping, analysis, and visualization on-premises or in the cloud.*

11:00 - 11:50: Best Paper session
Chairperson: Christian Heipke
- WE.4.1: #462 *Robust estimation in robot vision and photogrammetry: A general model and its applications.* **Jiayuan Li**, Yongjun Zhang, Qingwu Hu.
- WE.4.2: #717 *Towards efficient indoor/outdoor registration using planar polygons.* **Rahima Djahel**, Bruno Vallet, Pascal Monasse.
- WE.4.3: #572 *Water quality retrieval and algal bloom detection using high-resolution CubeSat imagery.* **Milad Niroumand-Jadidi**, Francesca Bovolo.
- WE.4.4: #653 *Joint estimation of road roughness from crowd-sourced bicycle acceleration measurements.* **Oskar Wage**, Monika Sester.
- WE.4.5: #118 *Knowledge and skills related to active optical sensors in the body of knowledge for earth observation and geoinformation (EO4GEO BoK).* **Clémence Dubois**, Boris Jutzi, Marc Olijslagers, Carsten Pathe, Christiane Schmullius, Martyna Anna Stelmaszczuk-Górska, Danny Vandenbroucke, Martin Weinmann.

12:30 - 13:30: Keynote Speaker #5
Chairperson: Lena Halounova
- **The Willem Schermerhorn Award.** George Vosselman, Chen Jun.
  Recipient: Michael Ying Yang.
- **Chenghu Zhou (CAS, China).** *Contribution of geospatial technology against COVID-19.*

13:30 - 14:15: Interactive poster session #5 (IPS.WE.1)
The list of posters scheduled for this session are provided at the end of this document.

14:15 - 15:00: Interactive poster session #6 (IPS.WE.2)
The list of posters scheduled for this session are provided at the end of this document.

15:15 - 16:15: Keynote Speaker #6
Chairperson: Charles Toth
- **The Schwidefsky Medal.** Uwe Sörgel, Georg Bareth, Charles Toth.
  Recipient: Derek Lichti.
- **Christoph Stiller (Univ. Karlsruhe & KIT, Germany).** *Automated driving with and without maps.*

16:30 - 17:20: *2D Segmentation and Classification* *(Technical Commission II)*
Chairperson: Ribana Roscher
- WE.5.1: #178 *Bidirectional Multi-Scale Attention Networks for Semantic Segmentation of Oblique UAV Imagery*. **Ye Lyu**, George Vosselman, Gui-Song Xia, Michael Ying Yang.
- WE.5.2: #271 *Semi-supervised segmentation of concrete aggregate using consensus regularisation and prior guidance*. **Max Coenen**, Tobias Schack, Dries Beyer, Christian Heipke, Michael Haist.
- WE.5.3: #153 *Remote sensing image classification with the SEN12MS dataset*. **Michael Schmitt**, Yu-Lun Wu.
- WE.5.4: #142 *Detecting Cracks and Spalling Automatically in Extreme Events by End-to-end Deep Learning Frameworks*. **Yongsheng Bai**, Halil Sezen, Alper Yilmaz.

17:30 - 18:20: *3D Registration* *(Technical Commission II)*
Chairperson: Franz Rottensteiner
- WE.6.1: #776 *Maximum Consensus Localization using LiDAR Sensors*. **Jeldrik Axmann**, Claus Brenner.
- WE.6.2: #174 *Influence of co-alignment procedures on the co-registration accuracy of multi-epoch SfM points clouds*. **Mirko Saponaro**, Alessandra Capolupo, Giacomo Caporusso, Eufemia Tarantino.
- WE.6.3: #337 *Photogrammetry and computed tomography point cloud registration using virtual control points*. **Kun Zhan**, Dieter Fritsch, Joerg F Wagner. *(asking for earlier session)*
- WE.6.4: #733 *Registration optimization of mobile handheld scanner point clouds with static scans*. **Victor Alteirac**, Hélène Macher, Tania Landes.

18:30 - 19:20: *Stereo Matching* *(Technical Commission II)*
Chairperson: Ewelina Rupnik
- WE.7.1: #263 *Mixed probability models for aleatoric uncertainty estimation in the context of dense stereo matching*. **Zeyun Zhong**, Max Mehltretter.
- WE.7.2: #151 *Real-time depth map estimation from infrared stereo images of RGB-D cameras*. Jiageng Zhong, **Ming Li**, Xuan Liao, Jiangying Qin, Hanqi Zhang, Qi Guo. *(asking for earlier session)*
- WE.7.3: #333 *3D Surface Reconstruction From Multi-Date Satellite Images*. **Bullinger, Sebastian**, Christoph Bodensteiner, Michael Arens.
- WE.7.4: #426 *A new stereo dense matching benchmark dataset for deep learning*. **Teng Wu**, Bruno Vallet, Marc Pierrot-Deseilligny, Ewelina Rupnik.

08:00 - 08:50: Digital Twins
Chairpersons: Arzu Çoltekin (FHNW), Sidonie Christophe (LASTIG)
- TH.1.1: #658 Image-Based Reality-Capturing and 3d Modelling for The Creation of VR Cycling Simulations. **Wissam Wahbeh**, Manuela Ammann, Stephan Nebiker, Michael Van Eggermond, Alexander Erath.
- TH.1.2: #382 *Creating 3D indoor first responder situation awareness in real-time through a head-mounted AR device*. **Bart-Peter Smit**, Robert Voûte, Edward Verbree.
- TH.1.3: #671 *Embodied digital twins for environmental applications*. Pejman Sajjadi, Jiayan Zhao, Jan Oliver Wallgrun, Jiawei Huang, Mahda Bagher, **Alexander Klippel**.
- TH.1.4: #578 *Hybrid GIS-BIM approach for the Torino Digital-Twin: the implementation of a 3D city geodatabase for floor-level urban analysis*. **Giulia Sammartano**, Marco Avena, Marco Cappellazzo, Antonia Spanò.

09:00 - 09:50: Unconventional applications for geospatial deep learning
Chairpersons: Matthieu Molinier (VTT), Devis Tuia (EPFL)
- TH.2.1: #306 *Deep learning for vessel detection and identification from spaceborne optical imagery*. **Giona Matasci,** Jonathan Plante, Kevin Kasa, Payam Mousavi, Andrew Stewart, Andrew Macdonald, Anne Webster, Jennifer Busler.
- TH.2.2: #512 *Deep no learning approach for unsupervised change detection in hyperspectral images*. **Sudipan Saha**; Lukas Kondmann; Xiao Xiang Zhu.
- TH.2.3: #649 *JUngle-Net: using explainable machine learning to gain new insights into the appearance of wilderness in satellite imagery*. **Timo Tjaden Stomberg**, Immanuel Weber, Michael Schmitt, Ribana Roscher.
- TH.2.4: #708 *End-to-end physics-informed representation learning from and for satellite ocean remote sensing data*. **Ronan Fablet**, Mohamed-Mahmoud Amar, Quentin Febvre, Maxime Beauchamp, Bertrand Chapron.

10:00 - 10:50: AI for Knowledge Discovery in Geosciences
Chairpersons: Anca Anghelea (ESA), Diego Fernandez-Prieto (ESA)
- TH.3.1: #252 *AI4EO: Reasoning, Uncertainty, Ethics and Beyond*. **XiaoXiang Zhu.**
- TH.3.2: #258 *Causal inference in Earth system sciences*. **Jakob Runge.**
- TH.3.3: #316 *Explainable Deep Learning: Paradigms for Earth Observation*. **Mihai Datcu.**
- TH.3.4: #317 *Asking questions to Sentinel images: a deep learning perspective*. **Devis Tuia**, Sylvain Lobry.
- TH.3.5: #730 *Remote sensing, AI and innovative prediction methods for adapting cities to the impacts of the climate change*. **Beril Sirmacek.**
- TH.3.6: #253 *Earth system data cubes: towards a multivariate understanding of regional to global land surface dynamics*. **Miguel Mahecha,** Fabian Gans, Gunnar Brandt, Markus Reichstein, Carsten Bruckmann.

11:00 - 11:50: Towards resilient & ubiquitous navigation
Chairperson: Charles Toth (OSU)
- TH.4.1: #775 *Cubesat onboard algorithm for space debris motion determination by processing stereo images*. **Sergei Petrovich Simakov,** Igor Vitalevich Belokonov.

- TH.4.2: #417 *Image-based orientation determination of mobile sensor platforms*. **Oliver Hasler**, Stephan Nebiker.
- TH.4.3: #479 *Analysis of positioning deviation between Beidou and GPS based on National Reference Stations in China*. **Ming Chen**, Qinglan Zhang.
- TH.4.4: #513 *Feasibility Verification of Virtual Reference Station Technology in Geological Hazard Monitoring*. **Qinglan Zhang**, Ming Chen, Junli Wu, Chaoqian Xu, Fan Wang.
- TH.4.5: #745 *Assessment of car collaborative positioning with UWB and vision*. **Andrea Masiero**, Charles Toth, Jelena Gabela, Guenther Retscher.
- TH.4.6: #146 *Dynamic routing for navigation in changing unknown maps using deep reinforcement learning*. **Yuci Han**, Alper Yimaz.

13:00 - 15:00: Forum #1

Towards Transformational Change: Potential Contributions of ISPRS and the Role of the Youth in Sustainable Development

(organized by UNEP and ISPRS Student Consortium)
Coordination :
- *ISPRS Student Consortium: Sheryl Rose Reyes, Nicolas Pucino and Laxmi Thapa.*
- *UNEP: Adele Roccato and Pierre Boileau.*

15:15 - 16:15: Keynote Speaker #7
Chairperson: Songnian Li
- **The Samuel Gamble Award.** Marlene McKinnon, Songnian Li.
  Recipients: Jonathan Li & Jan Skaloud.
- **Sarah Gallagher (Univ. of Western Ontario and Canadian Space Agency, Canada).** *Space-based Earth observations. Challenges and new opportunities.*

16:30 - 17:20: ISPRS Scientific Initiatives & Education and Capacity Building Initiatives (I)
Chairperson: Songnian Li (Ryerson University)
- TH.5.1: *The ISPRS Benchmark Test on Indoor Modelling*. **Kourosh Khoshelham**, Ha Tran, Debaditya Acharya, Lucia Díaz Vilariño, Zhizhong Kang, Sagi Dalyot.
- TH.5.2: *GeoBIM benchmark: reference study on software support for open standards of city and building models*. **Francesca Noardo**, Ken Arroyo Ohori, Filip Biljecki, Claire Ellul, Lars Harrie, Thomas Krijnen, Margarita Kokla, Jantien Stoter.
- TH.5.3: *International Benchmarking of terrestrial Image-based Point Clouds for Forestry*. Markus Hollaus, **Martin Mokroš**, Yunsheng Wang.

17:30 - 18:20: ISPRS Scientific Initiatives & Education and Capacity Building Initiatives (II)
Chairperson: Songnian Li (Ryerson University)
- TH.6.1: *Development of an Online Spectral Library for Pigments of Paintings*. **Shuqiang Lyu**, **Miaole Hou**, Ahmed Shaker Abdelrahman, Jeffrey Lee.
- TH.6.2: #411 *UP4DREAM capacity building project: UAS based mapping in developing countries.* Alessio Calantropio, **Filiberto Chiabrando**, Jessica Comino, Andrea Lingua, Paolo Maschio, Tautvydas Juskauskas.
- TH.6.3: *Development of educational content for the "D3MOBILE Metrology World League*. **Juan Pedro Ortiz-Sanz**, Mariluz Gil-Docampo, Teresa Rego-Sanmartín, Marcos Arza-García, Grazia Tucci, Erica Isabella Parisi, Valentina Bonora, Francesco Mugnai.
- TH.6.4: *LightCam: Enlightening the camera obscura - Where photogrammetry, computer and robotic vision meet*. **Erica Nocerino**, Fabio Menna, Ronny Hänsch.

18:30 - 19:20: Cultural Heritage
Chairpersons: Michael Younan (GSEC), Fulvio Rinaudo (Politecnico di Torino)
- TH.7.1: #264 *Modelling the evolution of the archeological works developed in Qubbet El Hawa (Aswan, Egypt)*. **Jose Luis Pérez-García**, Antonio T. Mozas-Calvache, Jose Miguel Gómez-López, Alejandro Jiménez-Serrano.
- TH.7.2: #707 *Integrating topographic, photogrammetric and laser scanning techniques for a Scan-to-BIM process*. **Mauro Lo Brutto**, Emanuele Iuculano, Paolo Lo Giudice.
- TH.7.3: #732 *HBIM modelling for an historical urban centre*. **Antonia Spanò**, Marco Avena, Giulia Sammartano, Elisabetta Colucci.
- TH.7.4: #302 *The reliability assessment of the TLS registration methods - the case study of the Royal Castle in Warsaw*. **Jakub Markiewicz**, Sławomir Łapiński, Agnieszka Bocheńska, Patryk Kot.

Friday 9 July
Forum & ISPRS Geospatial Lecture Day 2021

Forum #2:
Geo for Pandemics
Coordination : Fazlay Faruque, chairman of ICWG III/IVc "Environment and Health"

- <u>Session 1</u> : 08:00 - 11:00
- <u>Session 2</u> : 15:00 - 18:00

ISPRS Geospatial Lecture Day 2021

Chairperson: Jan Dirk Wegner (University of Zurich)

8:30 - 11:00: Remote Sensing

Chairperson: Uwe Sörgel (University of Stuttgart)

- 8:30 – 9:30: **Timo Balz** (Wuhan University). *PS-InSAR for surface motion estimation.*
- 9:30 – 10:30: **Gottfried Mandlburger** (TU Wien). *State and Trends in Airborne LiDAR.*
- 10:30 – 11:00: coffee break & discussion chats.

11:00 Deep learning

Chairperson: Ribana Roscher (University of Bonn)

- 11:00 – 12:00: **Loic Landrieu** (IGN-ENSG). *Deep learning for 3D Point Cloud Analysis.*

- 12:00 – 13:00: **Charlotte Pelletier** (UBS Vannes) & **Marc Rußwurm** (TUM). *Deep Learning for time series classification.*
- 13:00 – 14:00: lunch break & discussion chats.

14:00 Photogrammetry

Chairperson: Erica Nocerino (Aix Marseille Université)

- 14:00 – 15:00: **Ewelina Rupnik** (IGN-ENSG, Univ. Gustave Eiffel, LASTIG), **Marc Pierrot-Deseilligny** (IGN-ENSG, Univ. Gustave Eiffel, LASTIG), **Yilin Zhou** (Amadeus), **Mehdi Daakir** (CERN). *High-precision mapping with UAVs.*
- 15:00 – 16:00: **Davide Cucci** (EPFL). *Dynamic networks.*
- 16:00 – 16:30: coffee break & discussion chats.

16:30 GIS & OGC

Chairperson: Margarita Kokla (National Technical University of Athens)

- 16:30 – 17:30: **Serena Coetzee** (University of Pretoria) & **Maria Antonia Brovelli** (Politecnico di Milano). *Geospatial Tools for Collaborative Humanitarian Mapping.*
- 17:30 – 18:30: **Peter Baumann** (Jacobs University). *Federated Earth Datacubes: Concepts, Standards, Services.*
- 18:30-19:00: discussion chats.

Interactive poster session #1 (IPS.MO.1): Monday July 5 - 13:30 - 14:15

- **#127** *Architecting Location Intelligence platforms using open source components*. **Ali Benahmed Daho**, Hatem Bekhelifi.
- **#130** *Remote sensing and nighttime urban heat island*. **Blanca Arellano**, Josep Roca.
- **#136** *A novel approach to register multi-platform point clouds for rockfall monitoring*. **Dimitrios Bolkas**, Gabriel Walton, Ryan Kromer, Timothy Sichler, Weidner Luke.
- **#141** *Triangulation and Time-of-flight Based 3D Digitisation Techniques of Cultural Heritage Structures*. **Cihan Altuntas**.
- **#154** *Onboard/on-ground image processing chain for high-resolution Earth observation satellites*. **Edoardo Cucchetti**, Christophe Latry, Gwendoline Blanchet, Mickael Bruno, Jean-Marc Delvit.
- **#170** *Supervised classification methods for automatic damage detection caused by heavy rainfall using multitemporal high resolution optical imagery and auxiliary data*. **Arnaud Cerbelaud**, Laure Roupioz, Gwendoline Blanchet, Pascal Breil, Xavier Briottet.
- **#191** *RPAS based tracking of machinery used in asphalt paving process*. **Guido Martin Staub**, Henry Diverth Montecino, José Esteban Díaz, Mauricio Alejandro Pradena, Seirgei Miller, Marcos Alfonso Díaz.
- **#210** *Identification of misclassified pixels in semantic segmentation with uncertainty evaluation*. **Lina Emilie Budde**, Dimitri Bulatov, Dorota Iwaszczuk.
- **#212** *Active layer thickness retrieval over the Qinghai-Tibet plateau from 2000 to 2020 based on inSAR-measured subsidence and multi-layer soil moisture*. **Tian Chang**, Jiangping Han, Zhenshi Li, Yuliang Wen, Tong Hao, Ping Lu, Rongxing Li.
- **#213** *Semantic segmentation of burned areas in satellite images using a U-Net-based convolutional neural network*. **Anna Katharina Brand**, Abhishek Manandhar.
- **#215** *Performance analysis of the IOPES seamless indoor-outdoor positioning approach*. **Eduard Angelats**, Pedro F. Espín-López, José Antonio Navarro, M. Eulàlia Parés.
- **#218** *Automatic object segmentation to support crisis management of large-scale events*. **Seyed Majid Azimi**, Ralph Kiefl, Veronika Gstaiger, Reza Bahmanyar, Nina Merkle, Corentin Henry, Dominik Rosenbaum, Franz Kurz.
- **#251** *Analysis on process quality control technology of geographical national conditions monitoring*. **Su Yin**.
- **#255** *Calibration and validation of the Intel t265 for visual localisation and tracking underwater*. Tim Appelt, **Joschka Van Der Lucht**, Michael Bleier, Andreas Nüchter.
- **#261** *Landslide Detection in Central America using the Differential Bare Soil Index*. *Alexander Ariza*, *Norma Angelica Davila*, *Hannah Kemper*, Gerhard Kemper.
- **#320** *Semantic segmentation of Mobile Laser Scanning point clouds with Long Short-Term Memory networks: Preliminary results*. **Jesús Balado Frías**, Peter Van Oosterom, Lucía Díaz-Vilariño, Pedro Arias.
- **#327** *Urban parametric perception*. *The case study of the historic centre of Perugia*. **Fabio Bianconi**, Marco Filippucci, Marco Seccaroni, Costanza Maria Aquinardi.
- **#331** *Wood and generative algorithms for the comparison between models and reality*. **Fabio Bianconi**, Marco Filippucci, Giulia Pelliccia.

- **#341** *Qualitative testing of an advanced terrestrial laser scanner simulator: users experience and feedback*. **Maria Chizhova**, Denys Gorkovchuk, Tatyana Kachkovskaya, Darius Popovas, Julia Gorkovchuk, Thomas Luhmann, Mona Hess.
- **#343** *Random noise assessment in aerial and satellite images*. **Aleksandr Chibunichev**, Irina Anikeeva.
- **#346** *Requirements for aerial images quality, obtained for mapping purposes*. **Aleksandr Chibunichev**, Irina Anikeeva.
- **#350** *Deep learning based roof type classification using very high resolution aerial imagery*. **Mehmet Buyukdemircioglu**, Recep Can, Sultan Kocaman.
- **#386** *Use of very high spatial resolution imagery for mapping wood energy potential from tropical managed forest stands, Reunion Island*. **Hélène Bley-Dalouman**, François Broust, Jean Prevost, Annelise Tran.
- **#398** *Rocky shoreline extraction using a Deep Learning model and Object-Based Image Analysis*. **Soumia Bengoufa**, Simona Niculescu, Mustapha Kamel Mihoubi, Rabah Belkessa, Katia Abbad.
- **#409** *Open urban and forest datasets from a high-performance mobile mapping backpack – a contribution for advancing the creation of digital city twins*. **Stefan Blaser**, Jonas Meyer, Stephan Nebiker.
- **#415** *Surface urban heat island effects on bio-productive rural land covers surrounding a low density urban center*. **Michael Burnett**, Dongmei Chen.
- **#418** *Forest cover mapping and Pinus species classification using very high-resolution satellite images and random forest*. **Laura Alonso**, Juan Picos, Julia Armesto.
- **#429** *Information acquisition on pedestrian movements in urban traffic with a mobile multi-sensor system*. **Björn Borgmann**, Marcus Hebel, Michael Arens, Uwe Stilla.
- **#437** *Development of a low-cost, hand-held multi-sensor system for the monitoring of small water bodies*. **Robert Blaskow**, Ellen Schwalbe.
- **#445** *RLSnake: a hybrid reinforcement learning approach for road detection*. **Nicolò Botteghi**, Beril Sirmacek, Cem Unsalan.
- **#475** *Research on evaluation method of real estate registration data quality*. **Chun Xi Chen**, He Zhang, Kunli Jiang, Haitao Zhao, Wenjun Xie, Chuan He, Su Yin.
- **#482** *Concepts – locations – emotions: semantic analysis and visualization of climate change texts*. **Niki Anastopoulou**, Marinos Kavouras, Margarita Kokla, Eleni Tomai.
- **#484** *Automatic detection and vectorization of roadway elements in point cloud and panoramic images from mobile mapping system*. **Étienne Barçon**, Arthur Picard.
- **#495** *Investigation of the changes of lake surface temperatures and areas: case study of Burdur and Egirdir lakes, Turkey*. **Nagihan Aslan**, Dilek Koc-San.
- **#516** *Photogrammetric underwater and UAS surveys of archaeological sites: the case study of the Roman shipwreck of Torre Santa Sabina*. **Alessio Calantropio**, Filiberto Chiabrando, Rita Auriemma.
- **#522** *Spatio temporal data cube applied to AIS containerships trend analysis in the early year of the Belt and Road Initiative - From global to local scale*. **Emere Arco**, Andrea Ajmar, Fabio Cremaschini, Cristina Monaco.
- **#532** *A portable opto-acoustic survey solution for mapping of underwater targets*. **Bertrand Chemisky**, Erica Nocerino, Fabio Menna, Mohamad Motasem Nawaf, Pierre Drap.
- **#536** *Development of a geo-analytics platform for post-disaster assessment*. **Kubra Atasoy**, Sultan Kocaman.
- **#537** *Automated reflectance target detection for automated vicarious radiometric correction of UAV images*. **Seung Hwan Ban**, Tae Jung Kim.
- **#566** *Influence of illumination changes on image-based 3D surface reconstruction*. **Nazarena Bruno**, Anna Giacomini, Riccardo Roncella, Klaus Thoeni.
- **#567** *Upscaling and validation of RTK-direct georeferenced UAV-based RGB image data with Planet imagery using polygon grids for pasture monitoring*. **Georg Bareth**, Christoph Hütt.

- **#570** *Road type classification of MLS point clouds using deep learning*. **Qian Bai**, Roderik Lindenbergh, Julien Vijverberg, Jeroen Guelen.
- **#594** *Development of panoramic virtual tours system based on low cost devices*. **Issam Boukerch**, Bachir Takarli, Kamal Saidi, Mokrane Kariche, Abd El Kader Mestapha Meguenni.
- **#605** *Toward a multi-source remote sensing wetland inventory of the US: preliminary results on wetland inventory of Minnesota*. **Sarina Adeli**, Bahram Salehi, Masoud Mahdianpari, Lindi J. Quackenbush.
- **#613** *Social network analysis of spatial human mobility behaviour in infectious disease interaction: an exploratory evidence of tuberculosis in Malaysia*. **Ilham Abdul Jalil**, Abdul Rauf Abdul Rasam.
- **#626** *Geophysical and UAV-based observations over a flood defense structure : application to the Polder2C's experimental dike*. **Raphaël Antoine**, Cyrille Fauchard, Vincent Guilbert, Bruno Beaucamp, Cyril Ledun, Christophe Heinkelé, Lucile Saussaye, Steven Muylaert, Wim Vancalster, Davy Depreiter, Philippe Sergent.
- **#669** *AI4GEO : a data intelligence platform for 3D geospatial mapping*. **Pierre-Marie Brunet**, Pierre Lassalle, Simon Baillarin, Bruno Vallet, Arnaud Le Bris, Gaëlle Romeyer, Guy Le Besnarais, Flora Weissgerber, Gilles Foulon, Vincent Gaudissart, Christophe Triquet, Michael Darques, Gwenael Souille, Laurent Gabet, Cedrik Ferrero, Thanh-Long Huynh, Emeric Lavergne.
- **#684** *Building OPENDRIVE model from mobile mapping data*. **Mark Barsi**, Arpad Barsi.
- **#697** *3D Content Generation using Hybrid Aerial Sensor Data*. **Uwe Bacher**.
- **#701** *Earthquake prediction evaluation based on VLF data using a novel "intersection-union" method*. **Wrya Barghi**, Mahmoud Reza Delavar, Mahmoud Shahabadi, Mehdi Zare, Seyed Ahmad Eslaminezhad, Hadi Bayat.
- **#747** *UAV UWB positioning close to building facades: a case study*. **Myrto Bouloukou**, Andrea Masiero, Antonio Vettore, Vassilis Gikas.
- **#758** *Post-disaster assessment of mangrove forest recovery in Lawaan-Balangiga, Eastern Samar using NDVI Time Series Analysis*. **Keith Ann E**. **Cabello**, Mark Jonathan Q. Germentil, Ariel C. Blanco, Edgardo G. Macatulad, Severino G. Salmo III.
- **#763** *Adaptive and Non-adaptive Fusion Algorithms Analysis for Depth Maps Generated using Census and Convolutional Neural networks (MC-CNN)*. **Hessah Albanwan**, Rongjun Qin.
- **#774** *Time series analysis of urbanization impact on the temperature variations off Mumbai coast*. **Sutapa Bhattacharjee**, Lekshmi K, Rishikesh Bharti.
- **#780** *Estimating contribution of water flow components to kameng river basin using hydrological modelling*. **Siddharth Arora**, Anil V. Kulkarni, Prosenjit Ghosh, S.K. Satheesh.
- **#781** *Determining the suitable location for the metallurgical and steel processing factory in Mongolia using GIS-based multi-criteria analysis methods*. **Zolzaya Adiya**, Battogtokh Dorjgotov, Sainbuyan Bayarsaikhan, Myagmartseren Purevtseren.
- **#783** *Evaluation of Semi-supervised learning for CNN-based Change Detection*. **Evangelos Bousias Alexakis**, Costas Armenakis.
- **#787** *Suitable dem assessment study for data scarce cities towards urban extreme and nuisance flood mapping*. **Anjaneyulu Akkimi**, Subashisa Dutta.
- **#793** *GNSS and photogrammetry by the same tool: a first evaluation of the Leica gs18i receiver*. **Vittorio Casella**, Marica Franzini, Ambrogio Maria Manzino.
- **#809** *Label-efficient Deep Learning-based Semantic Segmentation of Building Point Cloud at LoD3 Level*. **Yuwei Cao**, Marco Scaioni.
- **#822** *Raster Data Based Automated Noise Data Integration for Noise Mapping Limiting Data Dependency*. **Shruti Bharadwaj**, Rakesh Dubey, Md Iltaf Zafar, Susham Biswas.
- **#823** *The What, Where & When! Multi-disciplinary Trend -Detection, -Analysis & -Forecasting From Aerial Film Archives*. Rolf Becker.

Interactive poster session #2 (IPS.MO.2): Monday July 5 - 14:15 - 15:00

- **#109** *Machine learning techniques for knowledge extraction from satellite images: application to specific area types*. **Corneliu Octavian Dumitru**, Gottfried Schwarz, Mihai Datcu.
- **#116** *Field validation of ICESat-2 data along CHINARE route in East Antarctica*. **Haotian Cui**, Rongxing Li, Hongwei Li, Tong Hao, Gang Qiao, Youquan He, Gang Hai, Huan Xie, Yuan Cheng, Bofeng Li.
- **#121** *Interactive extraction of linear structures from LiDAR raw data for archaeomorphological structure prospection*. **Philippe Even**, Axelle Grzesznik, Anne Gebhardt, Thomas Chenal, Pierre Even, Phuc Ngo.
- **#125** *A calculation method of ecosystem service value based on product of national geographic conditions monitoring in China*. **Tao Cheng**, Xinyan Zheng, Huixian Chen, Jin Liu, Xinyuan Gao, Weiwei Zhang.
- **#133** *Towards more efficient UAS data acquisition: camera auto mount pivoting oblique survey*. **Igor Sales Da Gama Campos.**
- **#145** *Multi-temporal analysis of land use and vegetation cover in São Francisco do Sul and Itapoá, Santa Catarina State - Brazil: implications to groundwater contamination*. **Ana Clara S Jardim V Ferreira**, Liliana Sayuri Osako.
- **#156** *AI in support to water quality monitoring*. **Carlo Andrea Biraghi**, Maryam Lotfian, Daniela Carrion, Maria Brovelli.
- **#171** *Moving toward open geospatial systems: the un open gis initiative*. **Maria Antonia Brovelli**, Ki-Joune Li, Kyoung-Soo Eom.
- **#172** 55 *Years in ISPRS - The ambassador of our profession*. **Lawrence W. Fritz.**
- **#179** *Generative adversarial network to generalise urban area in topographic maps*. **Azelle Courtial**, Guillaume Touya, Xiang Zhang.
- **#185** *Eelgrass Mapping with Sentinel-2 and UAV Data in Prince Edward Island (Canada)*. **Eleanor Gallant**, Armand Larocque, Brigitte Leblon, Angela Douglas.
- **#186** *An efficient representation of 3D buildings: application to the evaluation of city models*. **Oussama Ennafii**, Arnaud Le Bris, Florent Lafarge, Clément Mallet.
- **#205** *Are city features influencing the behavior of photographers? an analysis of geo-referenced photos shooting orientation*. **Thibaud Chassin**, Jens Ingensand.
- **#216** *Decay classification using artificial intelligence*. **Elisabetta Caterina Giovannini**, Andrea Tomalini, Edoardo Pristeri, Letizia Bergamasco, Massimiliano Lo Turco.
- **#232** *Fusing multi-modal data for supervised change detection*. **Patrick Ebel**, Sudipan Saha, Xiao Xiang Zhu.
- **#235** *Environmental challenges, technical solutions and standard operating procedures for data collection in photogrammetric studies toward a unified database of objects and features in underwater caves in Mexico*. **Julien Fortin**, Sam Meacham, Dominique Rissolo, Christophe Le Maillot, Fred Devos.
- **#240** *Sentinel-2A based Imperviousness Monitoring of Urban Built Environment*. **Dyutisree Halder**, Rahul Dev Garg.
- **#247** *Deformation monitoring at European scale: the copernicus ground motion service*. **Michele Crosetto**, Lorenzo Solari, Joanna Balasis-Levinsen, Luke Bateson, Nicola Casagli, Michaela Frei, Anneleen Oyen, Dag Moldestad, Marek Mróz.
- **#281** *Review of high-resolution global land cover*. **Gorica Bratic**, Alberto Vavassori, Maria Antonia Brovelli.
- **#283** *Cooperative localisation using image sensors in a dynamic traffic scenario*. **Philipp Trusheim**, Yajie Chen, Franz Rottensteiner, Christian Heipke.
- **#295** *Evaluation of the seasonal nighttime LST-air temperature discrepancies and their relation to local climate zones (LCZ) in Strasbourg*. **Susana Del Pozo**, Tania Landes, Françoise Nerry, Pierre Kastendeuch, Georges Najjar, Nathalia Philipps, Susana Lagüela.

- **#329** *Exploitation of spectral and temporal information for mapping plant species in a former industrial site*. **Rollin Gimenez**, Guillaume Lassalle, Rémy Hédacq, Arnaud Elger, Dominique Dubucq, Anthony Credoz, Christelle Jennet, Sophie Fabre.
- **#344** *Automatic change detection of digital maps using aerial images and point clouds*. **Felix Dahle**, Ken Arroyo Ohori, Giorgio Agugiaro, Sven Briels.
- **#368** *Estimating surface flow velocities of rivers with thermal and RGB UAV imagery*. **Anette Eltner**, David Mader, Noemi Szopos, Balint Nagy, Jens Grundmann, Láslzó Bertalan.
- **#399** *Deep learning for automatic building damage assessment: application in post-disaster scenarios using UAV data*. **Alessio Calantropio**, Filiberto Chiabrando, Marco Codastefano, Elizabeth Bourke.
- **#402** 3D *city model as a first step towards digital twin of Sofia city*. **Hristiyan Dimitrov**, Dessislava Petrova-Antonova.
- **#406** *Unmanned aerial vehicle derived 3D model evaluation based on ICESat-2 for ice surface micro-topography analysis in east antarctica*. **Youquan He**, Gang Qiao, Hongwei Li, Xiaohan Yuan, Yanjun Li.
- **#416** *Connecting geometry and semantics via Artificial Intelligence: from 3D classification of heritage data to H-BIM representations*. **Valeria Croce**, Marco Giorgio Bevilacqua, Gabriella Caroti, Andrea Piemonte.
- **#441** *Zonation of subalpine lakes based on remotely sensed water quality parameters*. **Chiara Gerosa**, Mariano Bresciani, Giulia Luciani, Carlo Andrea Biraghi, Daniela Carrion, Michela Rogora, Maria Antonia Brovelli.
- **#459** *Analysis on the area changes and its influencing factors of the lakes in Wuhan city based on Google Earth Engine*. **Tiantian Gong**, Shuangyu Xie, Haonan Zhao.
- **#470** *Generating Synthetic 3D Point Segments for Improved Classification of Mobile Lidar Point Clouds*. **Sagar Chitnis**, Zexian Huang, Kourosh Khoshelham.
- **#474** *Towards free-viewpoint video capture in challenging environments for collaborative & immersive analysis*. **Anton Frolov**, Gareth Rendle, Adrian Kreskowski, Mariya Kaisheva, Bernd Froehlich, Volker Rodehorst.
- **#491** *A praxis on data quality evaluation of underground pipeline*. **Haitao Zhao**, Jin Zhou.
- **#494** *Spatial-Temporal Changes Of Land Degradation Caused By Natural And Human Induced Factors: Case Study Of Bulgan Province In Central Mongolia*. **Sainbayar Dalantai**, Erdenesukh Sumiya, Yuhai Bao, Munkhdulam Otgonbayar, Urtnasan Mandah, Bayartungalag Batsaikhan, Boldbaatar Natsagdorj.
- **#505** *Geovisualization of aerial photogrammetric flights for data quality assessment*. **Mehmet Buyukdemircioglu**, Sultan Kocaman.
- **#514** *MAGO approach for semantic segmentation: the case study of UAVid benchmark dataset*. **Sara Gagliolo**, Domenico Sguerso.
- **#521** *Predicting the infrared UAV imagery over the coast*. **Antoine Collin**, Dorothée James, Antoine Mury, Mathilde Letard, Benoit Guillot.
- **#525** *Ontology-based data mapping to support planning in Historical urban centres*. **Elisabetta Colucci**, Margarita Kokla, Francesca Noardo.
- **#540** *A comparison between 3D reconstruction using NeRF Neural Networks and MVS algorithms on cultural heritage images*. **Francesca Condorelli**, Fulvio Rinaudo, Francesco Salvadore, Stefano Tagliaventi.
- **#549** *Land subsidence hazard in Iran revealed by country-scale analysis of Sentinel-1 InSAR*. **Mahmud Haghshenas Haghighi**, Mahdi Motagh.
- **#561** *Concept to Analyze the Displacement Time Series of Individual Persistent Scatterers*. **Madeline Evers**, Antje Thiele, Horst Hammer, Erich Cadario, Karsten Schulz, Stefan Hinz.
- **#563** *Close-range photogrammetry method for SF6 Gas Insulated Line (GIL) deformation monitoring*. **Kamal Nur Fauzan**, Deni Suwardhi, Arnadi Murtiyoso, Irwan Gumilar, Teguh Purnama Sidiq.

- **#574** *Automated Detectıon of Collapsed Buıldıngs wıth Use of Optıcal and SAR Images, Case Study: Izmir Earthquake on October 30th,2020*. **Oguz Ekmekcioglu**, Nusret Demir.
- **#609** *Benchmarking of Convolutional Neural Network approaches for vegetation land cover mapping*. **Benjamin Carpentier**, Antoine Masse, Emeric Lavergne, Christophe Sannier.
- **#606** *On-site data-processing algorithm and optimization for airborne ice sounding radar configured on the "Snow Eagle 601"*. **Xiangbin Cui**, Shinan Lang, Lin Li, Bo Sun.
- **#615** *Quality evaluation of 3D building models based on low altitude imagery and airborne laser scanning point clouds*. **Grzegorz Gabara**, Piotr Sawicki.
- **#622** *Horizontal accuracy assessment of Google Earth data over typical regions of Australia using Worldview*. **Jing Guo**, Hongjing Tu, Hai Li, Ying Zhao, Jin Zhou.
- **#646** *Synthetic data generation pipeline for geometric deep learning in architecture*. **Stanislava Fedorova**, *Alberto Tono*, *Meher Shashwat Nigam*, *Jiayao Zhang*, *Amirhossein Ahmadnia*, *Cecilia Maria Bolognesi*, *Dominik L*. Michels.
- **#650** *Validation of a UAV-derived point cloud by semantic classification and comparison with TLS data*. **Marica Franzini**, Vittorio Casella, Paolo Marchese, Mattia Marini, Giovanna Della Porta, Fabrizio Felletti.
- **#652** *Large scale semantic segmentation of virtual environments to facilitate corrosion management*. **Robinson Luiz Garcia**, Patrick Nigri Happ, Raul Queiroz Feitosa.
- **#656** *Use of Landsat-8 OLI imagery and local indigenous knowledge for eelgrass mapping in eeyou istchee*. **Kevin Clyne**, Brigitte Leblon, Armand Larocque, Maycira Costa, Mélanie-Louise Leblanc, Ernie Rabbitskin, Marc Dunn.
- **#678** *Orientation vs. orientation: image processing for studies of dental morphology*. **Armen Gaboutchian**, Vladimir Knyaz, Sergey Vasilyev, Dmitriy Korost, Artur Kudaev.
- **#706** *Evaluation of sar to optical image translation using conditional generative adversarial network for cloud removal in a crop dataset*. **Luiz Eduardo Christovam**, Milton Hirokazu Shimabukuro, Maria De Lourdes Bueno Trindade Galo, Eija Honkavaara.
- **#736** *Improving RANSAC feature matching based on Geometric Relation*. **Abdelgwad Mohamed Elashry**, Bryan Sluis, Charles Toth.
- **#759** *Random forest-based river plastic detection with a handheld multispectral camera*. **Irene Cortesi**, Andrea Masiero, Michaela De Giglio, Grazia Tucci, Marco Dubbini.
- **#768** *Towards lifelong crop recognition using fully convolutional recurrent networks and sar image sequences*. **Jorge Andres Chamorro Martinez**, Raul Queiroz Feitosa, Patrick Nigri Happ, Jose David Bermudez Castro.
- **#771** *Monitoring and assessment of agri-urban land conversion using multi-sensor remote sensing and GIS techniques.* **Dominic Cabanlit Fargas Jr.**, Gilson Andre Morata Narciso, Ariel Conferido Blanco.
- **#814** *Urbanisation impact on creation of heat islands in large cities*. **Mateo Gašparović**, Šimun Zorić, Sudhir Kumar Singh.
- **#821** *Collaborative air quality mapping of different metropolitan cities of India*. **Rakesh Dubey**, Shruti Bharadwaj, Md Iltaf Zafar, Susham Biswas.

Interactive poster session #3 (IPS.TU.1): Tuesday July 6 - 13:30 - 14:15

- **#110** *Quality Assessment of Land Cover Classification Products Based on the Fuzzy–AHP Synthesis Model*. **Linbing Lyu**, Haipeng Chen, Wenjun Xie, Zongbiao Tian, Yuheng Chen.
- **#159** *Segmentation on Sentinel-3 data for surface heat island detection*. **Ioannis Kotaridis**, Maria Lazaridou.

- **#160** *Individual tree crown delineation from high spatial resolution imagery using U-net*. **Baoxin Hu**, Won Mo Jung.
- **#173** *A web-based platform for management and visualization of geometric documentation products of cultural heritage sites*. **Charalabos Ioannidis**, Ioannis Tallis, Ilias Pastos, Argyro-Maria Boutsi, Styliani Verykokou, Sofia Soile, Panagiotis Tokmakidis, Konstantinos Tokmakidis.
- **#187** *The potential of Sentinel-1 data to supplement high resolution earth observation data for monitoring green areas in cities*. **Anna Iglseder**, Moritz Bruggisser, Alena Dostálová, Norbert Pfeifer, Stefan Schlaffer, Wolfgang Wagner, Markus Hollaus.
- **#189** *Efficient tour planning for a measurement vehicle by combining Next Best View and Traveling Salesman*. **Joachim Gehrung**, Marcus Hebel, Michael Arens, Uwe Stilla.
- **#200** *Learning harmonised Pléiades and Sentinel-2 surface reflectances*. **Julien Michel**, Jordi Inglada.
- **#221** *Analysis and bias improvement of height models based on satellite images*. **Karsten Jacobsen**, Ricardo Passini.
- **#223** *Citywide estimation of parking space using aerial imagery and OSM data fusion with deep learning and fine-grained annotation*. **Corentin Henry**, Jens Hellekes, Nina Merkle, Seyed Majid Azimi, Franz Kurz.
- **#236** *Individual tree extraction from uav lidar point clouds based on self-adaptive mean shift segmentation*. **Zhenyang Hui**, Na Li, Yuanping Xia, Penggen Cheng, Yating He.
- **#241** *Application and Platform Design of Geospatial Big Data*. **Heng Li**, Wei Huang, Zhuhua Zha, Jing Yang.
- **#274** *Research oriented remote sensing image processing software design in practical courses for senior undergraduates*. **Haopeng Zhang**, Danpei Zhao, Fengying Xie, Zhiguo Jiang.
- **#286** *Geomorphological mapping of intertidal areas*. **Meng Lu**, Lars Groeneveld, Derek Karssenberg, Shunping Ji, Robert Jentink, Edwin Paree, Elisabeth Addink.
- **#287** *Practices*, *pitfalls and guidelines in visualising Lagrangian ocean analyses*. **Christian Kehl**, *Reint P.B.* **Fischer**, Erik Van Sebille.
- **#310** *A digital archive of Borobudur based on 3D point clouds*. **Masanori Kawato**, Liang Li, Kyoko Hasegawa, Motoaki Adachi, Hiroshi Yamaguchi, Fadjar Thufail, Sugeng Riyanto, Brahmantara Yk, Satoshi Tanaka.
- **#314** *Automatic Modelling of 3D Trees using Aerial LIDAR Point Cloud Data and Deep Learning*. **Richard Gerrit Kippers**, Luke Moth, Sander Jacob Oude Elberink.
- **#324** *Observations of continuous instability for Scar Inlet Ice Shelf, Antarctic Peninsula*. **Yanjun Li**, Gang Qiao, Xiaohan Yuan.
- **#326** *Evaluation of interior orientation modelling for cameras with aspheric lenses and image pre-processing with special emphasis to SfM reconstruction*. **Heidi Hastedt**, Thomas Luhmann, Heinz-Jürgen Przybilla, Rofallsi Robin.
- **#334** *Learning multi-modal features for dense matching-based confidence estimation*. **Konstantin Heinrich**, Max Mehltretter.
- **#342** *Data fusion of historical photographs with modern 3D data for an archaeological excavation – concept and first results*. **Paul Kalinowski**, Frank Both, Thomas Luhmann, Ursula Warnke.
- **#345** *A Comparative Study of Point Clouds Semantic Segmentation Using Three Different Neural Networks on the Railway Station Dataset*. **Yustisi Ardhitasari Lumban-Gaol**, Zhaiyu Chen, Mels Smit, Xiaoai Li, Mihai-Alexandru Erbasu, Edward Verbree, Jesús Balado, Martijn Meijers, Niels Van Der Vaart.
- **#349** 3D *reconstruction of ice shape using visible and thermal range imaging for aircraft icing study*. **Vladimir A. Knyaz**, Mikhail M. Novikov, Eugeny V. Ippolitov.
- **#355** *An efficient nD-point data structure for querying flood risk*. **Haicheng Liu**, Peter Van Oosterom, Bing Mao, Martijn Meijers, Rod Thompson.

- **#364** *A concept for the segmentation of individual urban trees from dense MLS point clouds.* **Philipp-Roman Hirt,** Ludwig Hoegner, Uwe Stilla.
- **#371** *Impact analysis of accidents on traffic flow based on massive floating car data*. **Jens Golze**, Udo Feuerhake, Christian Koetsier, Monika Sester.
- **#377** 1D-Convolutional *Autoencoder based hyperspectral data compression*. **Jannick Kuester**, Wolfgang Gross, Wolfgang Middelmann.
- **#389** *On the organization and validation of a pilot test of a mobile crowdsourced air quality monitoring system.* **Danielly García**, Francisco Vázquez-Gallego, M. Eulàlia Parés Calaf.
- **#396** *Satellite-Derived Bathymetry Using Convolutional Neural Networks and Multispectral Sentinel-2 Images.* **Yustisi Ardhitasari Lumban-Gaol**, Ken Arroyo Ohori, Ravi Peters.
- **#422** *Distribution and evolution of ice aprons in a changing climate in the Mont-Blanc massif (Western European Alps)*. **Suvrat Kaushik**, Ludovic Ravanel, Florence Magnin, Yajing Yan, Emmanuel Trouvé, Diego Cusicanqui.
- **#430** *Mapping barley lodging with UAS multispectral imagery and machine learning*. **Odysseas Vlachopoulos**, Brigitte Leblon, Jinfei Wang, Ataollah Haddadi, Armand Larocque, Greg Patterson.
- **#431** *Aerial photogrammetry and machine learning based regional landslide susceptibility assessment for an earthquake prone area in Turkey.* **Gizem Karakaş**, Sultan Kocaman, Candan Gökçeoğlu.
- **#432** *DeepLIO: Deep Lidar Inertial Sensor Fusion for Odometry Estimation.* **Arash Javanmard-Ghareshiran**, Dorota Iwaszczuk, Stefan Roth.
- **#468** *Building segmentation in agricultural land using high resolution satellite imagery based on deep learning approach.* **Liang-Yi Liu,** Chi-Kuei Wang.
- **#485** *Ice flow velocity mapping in East Antarctica using historical images from 1960s to 1980s: recent progress*. **Shulei Luo**, Yuan Cheng, Zhen Li, Yiyu Wang, Kangle Wang, Xiaofeng Wang, Gang Qiao, Wenkai Ye, Yanjun Li, Menglian Xia, Xiaohan Yuan, Yixiang Tian, Xiaohua Tong, Rongxing Li.
- **#496** *The Use AHP within GIS for destroyed areas in Damascus*, *Syria*. **Mohamad Khalil**, *J.* Satish Kumar.
- **#526** *An accurate real-time uav mapping solution for the generation of orthomosaics and surface models*. **Alexander Kern**, Phillipp Fanta-Jende, Philipp Glira, Felix Bruckmüller, Christoph Sulzbachner.
- **#545** *Real-time dense 3D reconstruction from monocular video data captured by low-cost UAVs*. **Max Hermann**, Boitumelo Ruf, Martin Weinmann.
- **#558** *Joint land cover and crop type mapping using multi-temporal Sentinel-2 data from various environmental zones in Greece*. **Christina Karakizi**, *Zacharias Kandylakis*, *Aristides D*. Vaiopoulos, Konstantinos Karantzalos.
- **#554** *Long-term monitoring of environmental changes along China-Europe railway express (CER Express) using multi-source remotely sensed data*. **Bohong Ma**, Xian Guo, Jie Jiang, Dubravko Culibrk, Shuai Ding, Marko Vilotic, Yang Li.
- **#562** *Enhancing uav coastal mapping using infrared pansharpening.* **Dorothée James**, Antoine Collin, Antoine Mury, Mathilde Letard, Benoit Guillot.
- **#568** *Using systems of parallel and distributed data processing to build hydrological models based on remote sensing data*. **Alexey A Kolesnikov**, Pavel M Kikin, Evgeny A Panidi, Anastasia G Rusina.
- **#569** *The use of Sentinel 1/2 vegetation indexes with GEE time series data in detecting land cover changes in the Sinop nuclear power plant construction site.* **Emre Çolak**, Madhu Chandra, Filiz Sunar.
- **#579** *Unsupervised object-based clustering in support of supervised point-based 3D point cloud classification*. **Eleonora Grilli**, Florent Poux, Fabio Remondino.

- **#581** *Individual banana tree crown delineation using unmanned aerial vehicle (UAV) images*. **Sudeep Kuikel**, Binita Upadhyay, Dhruba Aryal, Sudeep Bista, Sanjeevan Shrestha, Basant Awasthi.
- **#610** *Review on photogrammetric surface inspection in automotive production*. Max Erik Hödel, Ludwig Hoegner, Uwe Stilla.
- **#611** *From architectural survey to continuous monitoring: graph-based data management for cultural heritage conservation with Digital Twins*. **Marika Falcone**, Antonio Origlia, Massimiliano Campi, Sergio Di Martino.
- **#625** *The memory of a 2nd WW camp: 3D modeling using the combination of hybird technologies*. **Mathieu Koehl**, Yassine Seddik, Alexandre Calay, Juliette Brange, Michaël Landolt, Florian Basoge, Samuel Guillemin, Loic Lutz.
- **#636** *Multi-temporal image co-registration of UAV blocks: a comparison of different approaches*. **Pietro Garieri**, Massimo Riboloni, Gianfranco Forlani, Riccardo Roncella.
- **#647** *Evaluation of 3D UAS flight path planning algorithms*. **Paul Debus**, Volker Rodehorst.
- **#662** *Analysis of NO2 Tropospheric Column Amount at Airports in Malaysia Before and During Covid-19 Pandemic using Sentinel-5p Tropomi Data*. **Kasturi Devi Kanniah**, Nurul Amalin Fatihah Kamarul Zaman, Kannan Perumal.
- **#676** *Accessing and processing Brazilian Earth observation data cubes with the Open Data Cube platform*. **Vitor Conrado Faria Gomes**, Felipe Menino Carlos, Gilberto Ribeiro Queiroz, Karine Reis Ferreira, Rafael Santos.
- **#682** *Monitoring terrain deformations caused by underground mining using UAV data.* **Grzegorz Jóźków**, Agata Walicka, Andrzej Borkowski.
- **#687** *A method of water depth inversion in coastal area considering temperature information*. **Yu Liu**, Xinyuan Gao, Guanghui Wang, Tao Zhang, Jie Wang.
- **#691** *Water quality monitoring over Finger Lakes region using Sentinel-2 imagery on Google Earth Engine cloud computing platform*. **Rabia Munsaf Khan**, Bahram Salehi, Masoud Mahdianpari, Fariba Mohammadimanesh.
- **#711** *Investigating 3D reconstruction of non-collaborative surfaces integrating photogrammetry and photometric stereo*. **Ali Karami**, Fabio Menna, Fabio Remondino.
- **#713** *Issues of geographic information systems and thematic mapping application to analysis of epidemiological situation in large cities*. **Ilya Kuznetsov**, Evgeny Panidi, Pavel Kikin, Alexey Kolesnikov, Vladislav Korovka, Vladimir Galkin.
- **#716** *Low-cost DGPS assisted aerial triangulation for sub-decimetric accuracy with non-RTK UAVs*. **Francesco Ioli**, Livio Pinto, Francesco Ferrario.
- **#729** *CNN semantic segmentation to retrieve past land cover out of historical orthoimages and DSM*. **Arnaud Le Bris**, Clément Mallet, Sébastien Giordano.
- **#742** *Effects of geospatial data sources on the identification and characterization of burnt areas in portugal.* **Cidália Costa Fonte**, Joaquim Patriarca, Diogo Duarte.
- **#753** *Socioeconomic drivers of land use intensification in Fiji Islands: a geographical approach.* **David Lopez Cornelio**.
- **#800** *Bidirectional reflectance distribution function (brdf) of mixed pixels*. **Fadi Kizel**, Yulia Vidro.
- **#813** *Root phenotyping from X-ray computed tomography: skeleton extraction. Monica Herrero-Huerta, Valerian Meline, Anjali S. Iyer-Pascuzzi, Augusto M.* **Magalhanes**, *Mitchell R.* **Tunistra**, Yang Yang.

Interactive poster session #4 (IPS.TU.2): Tuesday July 6 - 14:15 - 15:00

- **#122** *Updating landslide inventory maps using high resolution digital orthophotos and Digital Surface and Elevation modeling: the case study of Brusque city, Santa Catarina State, Brazil.* **Liliana Sayuri Osako.**

- **#135** *Drone-Based Container Crane Inspection: Concept, Challenges and Preliminary Results*. **Mehdi Maboudi**, Ahmed Alamouri, Vanessa De Arriba López, Mohammad Shafi Bajauri, Cosima Berger, Markus Gerke.
- **#157** *Automated structural forest changes using lidar point clouds and GIS analyses*. **Ana Novo**, Higinio González-Jorge, Joaquín Martínez-Sánchez, José María Fernández-Alonso, Henrique Lorenzo.
- **#163** *On the classifier performance for simulation based debris detection in SAR imagery*. **Silvia Kuny**, Horst Hammer, Karsten Schulz.
- **#164** *Using tailored graphical tools to improve the quality of displacement maps at CTTC: the VETools*. **José Navarro**, Anna Barra, Oriol Monserrat, Michele Crosetto.
- **#181** *MRSSC: a benchmark dataset for multimodal remote sensing scene classification*. **Kang Liu**, Aodi Wu, Xue Wan, Shengyang Li.
- **#183** *Point cloud exploitation for structural modelling and analysis: a reliable workflow*. **Alighiero Lucidi**, Ersilia Giordano, Francesco Clementi, Ramona Quattrini.
- **#190** *Invasion of Savannas by Prosopis Trees in Eastern Africa: Exploring their Impacts on LULC Dynamics, Livelihoods and Implications on Soil Organic Carbon Stocks*. **Purity Rima Mbaabu**, Urs Schaffner, Sandra Eckert.
- **#192** *Analysis of the attacker and defender GAN models for the indoor navigation network*. **Lei Niu**, Yiquan Song, Yun Yu, Jiwei Chu, Shuqian Li.
- **#199** *Comparison of estimation methods to quantify methane plume concentration at high spatial resolution from hyperspectral images*. **Nicolas Nesme**, Pierre-Yves Foucher, Stéphanie Doz, Olivier Lezeaux, Claude Camy-Peyret.
- **#203** *Algorithm for the counter clockwise ordering of vertexes of slanted surfaces towards the generation of semantic gbxml*. **Roi Otero**, Susana Lagüela, Pedro Arias.
- **#208** *Determination of parking space and its concurrent usage over time using semantically segmented mobile mapping data*. **Artem Leichter**, Udo Feuerhake, Monika Sester.
- **#231** *High-Resolution Urban Mapping by Fusion of SAR and Optical Data*. **Naomi Petrushevsky**, Marco Manzoni, Andrea Virgilio Monti-Guarnieri.
- **#233** *Using geo-tagged Flickr images to explore the correlation between land cover classes and the location of bird observations*. **Maryam Lotfian**, Jens Ingensand.
- **#234** *A Procedure for Identifying Invasive Wild Parsnip Plants based on Visible Bands from UAV Images*. **Jingyi Liu**, Mohammad Dalower Hossain, Dongmei Chen.
- **#249** *A fully automated and fast approach for canopy cover estimation using high-resolution remote sensing imagery*. M. **Maimaitijiang**, V. Sagan, S. Bhadra, C. Nguyen, T.C. Mockler, N. Shakoor.
- **#256** *SAR-Based Coastline Detection and Monitoring*. **Marco Mazzolini**, Marco Manzoni, Andrea Virgilio Monti-Guarnieri, Naomi Petrushevsky.
- **#265** *Spatial temporal mapping of spread of water hyacinth in Winum gulf, lake Victoria*. **Seth Nyawacha**, Vivianne Meta, Ann Osio.
- **#272** *Citizen-generated geodata for natural parks use analysis: Insights from Facebook in the Insubria region*. **Daniele Oxoli**, Maria Antonia Brovelli.
- **#284** *Setup of a CORONA camera and image co-registration/calibration*. **Noah Kunz**, Peter Bochmann, Gerhard Kemper.
- **#300** *Exploring the use of classification uncertainty to improve classification accuracy*. **Daniel Moraes**, *Pedro Benevides, Francisco D*. **Moreira**, Hugo Costa, Mário Caetano.
- **#304** 3D *and hyperspectral data integration for assessing material degradation in medieval masonry heritage buildings*. **Pol Kolokoussis**, Margarita Skamantzari, Sevasti Tapinaki, Vassilia Karathanassi, Andreas Georgopoulos.
- **#311** *Bundle adjustment with polynomial point-to-camera distance dependent corrections for underwater photogrammetry*. **Erica Nocerino**, Fabio Menna, Armin Gruen.
- **#321** *Environmental influences on the stability of a permanently installed laser scanner*. **Mieke Kuschnerus**, Daniel Schröder, Roderik Lindenbergh.

- **#339** *A novel procedure for generation of sar-derived ztd maps for weather prediction: application to south africa use case*. **Andrea Monti Guarnieri**, Marco Manzoni, Agostino Meroni, Monia Molinari, Antonio Parodi, Naomi Petrushevsky, Giovanna Venuti, Alessandra Mascitelli.
- **#348** *3D least squares matching applied to micro-tomography data*. **Frank Liebold**, Renata Lorenzoni, Iurie Curosu, Fabien Léonard, Viktor Mechtcherine, Sidnei Paciornik, Hans-Gerd Maas.
- **#352** *Positive and negative roughness according to local differences between DEM surface and 3D reference planes*. **Jean Francois Parrot**, Carolina Ramirez Nunez.
- **#372** *Indoor mapping of a complex cultural heritage scene using TLS and HMLS laser scanning*. **Valeria-Ersilia Oniga**, Ana-Ioana Breaban, Eliza-Iulia Alexe, Cosmin Vasii.
- **#385** *Coherence and backscatter based cropland mapping using multi-temporal Sentinel-1 with dynamic time warping*. **Omer Gokberk Narin**, Saygin Abdikan, Caglar Bayik, Aliihsan Sekertekin, Ahmet Delen, Fusun Balik Sanli.
- **#397** *Advanced surface-reflected radiance correction for airborne hyperspectral image in the case of coastal red tide detection.* **Jee-Eun Min**, Seung-Kuk Lee, Joo-Hyung Ryu.
- **#440** *RPA positioning error influence on close range photogrammetry for industrial inspection*. **Michael Batista Machado**, Guilherme Canarin Marcellino, Jose Dueñas Salazar, Pedro Vieira Buschinelli, Daniel Juchem Regner, João Marcio Santos, Carla Alves Marinho, Tiago Da Costa Pinto.
- **#456** *Evaluating impressions based on gaze analysis and deep learning: A case study of attractiveness evaluation of streets in densely built-up wooden residential area*. **Takuya Oki**, Sayaka Kizawa.
- **#481** *Coral reefs on inhabited and uninhabited small islands*, *Spermonde archipelago*, *Indonesia*. **Nurjannah Nurdin**, Khairul Amri, Abd Rachman Rasyid, Dwia Aries Tina Pulubuhu, Nurliah Nurdin, Teruhisa Komatsu.
- **#493** *Digital twin and 3D documentation of a Theban tomb in Seir el-Medina (Egypt) using a multi-lenses photogrammetric approach*. **Alessandro Mandelli**, Cédric Gobeil, Christian Greco, Corinna Rossi.
- **#500** *Spatial distribution*, *pollution*, *and health risk assessment of heavy metal in industrial area soils of ulaanbaatar*, *mongolia*. **Oyunbat Purevsuren**, Batkhishig Ochirbat, Bayartungalag Batsaikhan, Frank Lehmkuhl, Martin Knippertz, Veit Nottebaum.
- **#507** *Integration of urban spatial data management and visualization with enterprise applications using open-source software*. **Hamidreza Ostadabbas**, Helmut Merz, Heike Weippert.
- **#517** *InSAR Collaborative Monitoring Mode and Multi-Mode Computing Services for Geohazards Identification in Open-Pit Mining Area.* **Jin Zhang**.
- **#529** *Deep learning algorithm for urban feature extraction using SAR data*. **Nikunj Pithva**, Anjana Vyas, Darshana Rawal, Vyjayanthi Nizalapur, Gaurav Jain, Anup Das.
- **#531** *Exploiting multi-camera constraints within bundle block adjustment: an experimental comparison*. **Eleonora Maset**, Ewelina Rupnik, Marc Pierrot-Deseilligny, Fabio Remondino, Andrea Fusiello.
- **#534** *Analysis of geometric and orthogonal correction accuracy for cas-500 satellite images*. **Yoo Jin Lee**, Taejung Kim.
- **#550** *Semantic segmentation for building façade 3D point cloud from 2D orthophoto images using transfer learning*. **Arnadi Murtiyoso**, Camille Lhenry, Tania Landes, Pierre Grussenmeyer, Emmanuel Alby.
- **#553** *First assessments into the use of commercial-grade solid state lidar for low cost heritage documentation*. **Arnadi Murtiyoso**, Pierre Grussenmeyer, Tania Landes, Hélène Macher.
- **#559** *Comparison and evaluation of spatial interpolation methods for monthly average air temperature of mongolia based on digital elevation model*. **Boldbaatar Natsagdorj**,

Sainbayar Dalantai, Erdenesukh Sumiya, Yuhai Bao, Sainbuyan Bayarsaikhan, Bayartungalag Batsaikhan, Danzanchadav Ganbat.

- **#591** *An extension of CityJSON for the support of point clouds.* **Gilles-Antoine Nys**, Abderrazzaq Kharroubi, Florent Poux, Roland Billen.
- **#599** *Comparison of classification algorithms of images for the mapping of the land covering in Tasso Fragoso municipality*, *Brazil*. **Paulo Roberto Mendes Pereira**, Francisco Wendell Dias Costa, Édson Luis Bolfe, Lucrencio Silvestre Macarringe, Adielson Corrêa Botelho.
- **#638** *Multi-sensor Approach to Leaf Area Index Estimation Using Statistical Machine Learning Models: A Case on Mangrove Forests*. **Kayziel Martinez**, Diana Faith Burgos, Ariel Blanco, Severino Salmo Iii.
- **#654** *Interactive videos as geospatial interfaces: A case study for regional promotion*. **Matej Zmitko**, Fabian Schwander, Doris Agotai, Arzu Çöltekin.
- **#663** *Evaluating tie points distribution*, *multiplicity and number on the accuracy of uav photogrammetry blocks*. **Vahid Mousavi**, Masood Varshosaz, Fabio Remondino.
- **#664** *Evaluating surface mesh reconstruction of open scenes*. **Yanis Marchand**, Bruno Vallet, Laurent Caraffa.
- **#672** *Application of UAV surveys for evaluating the Productivity Levels of Traditional and Mechanized Farmers in a Customary Land Tenure System*. **Dupe Nihinlola Olayinka**, Kayode Lanre Omolaye, Adewale James Ilesanmi, Chukwuma John Okolie, Ikenna Donald Arungwa.
- **#683** *Object-based change detection on acacia xanthophloea species degradation along lake Nakuru riparian reserve*. **Anne Achieng Osio**, Sébastien Lefèvre.
- **#696** *Quality aspects of high-definition maps*. **Janos Mate Logo**, Nikol Krausz, Vivien Poto, Arpad Barsi.
- **#718** *A capsule network approach to pavement crack detection using mobile laser scanning point clouds*. **Wenxuan Zhu**, *Weikai Tan*, *Lingfei Ma*, *Dedong Zhang*, *Jonathan Li*, *Michael A*. Chapman.
- **#731** *A novel deep learning based method for detection and counting of vehicles in urban traffic surveillance systems*. **Jhon Jamilton Majin**, Yessica Maria Valencia, Jose Alex Duenas, Marcelo Ricardo Stemmer, Mauricio Edgar Stivanello.
- **#740** *Automation of windows detection from geometric and radiometric information of point clouds in a scan-to-BIM process.* **Hélène Macher**, Leyla Roy, Tania Landes.
- **#748** *Geospatial assessment of human-wildlife-environment interactions for spatial decision support*. **Marguerite Madden**, Malvern Karidozo, William Langbauer, Ferrell Osborn, Andrea Presotto, Roger Parry.
- **#757** *Mapping Land Cover Change and Modelling Its Impacts on the Inundation Responses of the Agusan Marsh, Mindanao, Philippines.* **Meriam Makinano-Santillan**, Jojene Rendon Santillan.
- **#762** *Public-private cooperation models for efficient access to geospatial content*. **Simon Musäus**.
- **#765** *Spatial resolution sensitivity analysis of classification of Sentinel-2 images by pre-trained deep models from big earth net database*. **Forough Naali**, Tayeb Alipour-Fard, Hossein Arefi.
- **#788** *Accurate scaling and levelling in underwater photogrammetry with a pressure sensor*. **Fabio Menna**, Erica Nocerino, Bertrand Chemisky, Fabio Remondino, Pierre Drap.

Interactive poster session #5 (IPS.WE.1): Wednesday July 7 - 13:30 - 14:15

- **#128** *Image to Point Cloud Translation using Conditional Generative Adversarial Network for Airborne LiDAR data*. **Takayuki Shinohara,** Haoyi Xiu, Masashi Matsuoka.

- **#131** *Determination of regions suitable for agriculture in the gordon cosens forest of ontario by means of analytical hierarchy process with fuzzy logic inference*. **Rory Clifford Pittman,** Baoxin Hu, Gunho Sohn.
- **#150** *Geometric enhancement of the openstreetmap road network*. **Fatima Zohra Belhouari,** Issam Boukerch, Kamel Siyoucef.
- **#169** *Larger receptive field based RGB visual relocalization method using convolutional network*. **Jiangying Qin,** Ming Li, Deren Li, Xuan Liao, Jiageng Zhong, Hanqi Zhang.
- **#176** *DROACOR Reflectance Retrieval for Hyperspectral Mineral Exploration Using a Ground-Based Rotating Platform.* **Daniel Schläpfer**, Rudolf Richter, Christoph Popp, Petri Nygren.
- **#182** *Strict geometric calibration of an underwater laser triangulation system*. **Hannes Sardemann,** Christian Mulsow, Hans-Gerd Maas.
- **#201** *3D point cloud data processing and infrastructure information models: methods and findings from SAFEWAY project.* **Mario Soilán**, Andrés Justo, Ana Sánchez-Rodriguez, Daniel Lamas, Belén Riveiro.
- **#204** *Water turbidity estimation from LiDAR bathymetry data by full-waveform analysis - comparison of two approaches*. **Katja Richter,** David Mader, Patrick Westfeld, Hans-Gerd Maas.
- **#207** *Ambiguity concept in stereo matching pipeline*. **Emmanuelle Sarrazin,** Myriam Cournet, Loïc Dumas, Véronique Defonte, Quentin Fardet, Yoann Steux, Natalia Jimenez Diaz, Emmanuel Dubois, David Youssefi, Fabrice Buffe.
- **#211** *Detecting the sources of ice block falls at the Martian North polar scarps by analysis of multi-temporal HiRISE imagery*. **Shu Su,** Lida Fanara, Xin Zhang, Klaus Gwinner, Ernst Hauber, Jürgen Oberst.
- **#225** *Assessing the Similarities of 3D Simulation Model Outcomes*. **Alexander Kirby Smith,** Suzana Dragicevic.
- **#239** *Inversing glacier albedo in high mountain asia based on sentinel-3 satellite data*. **Yixiang Tian,** Zejun Liu.
- **#248** *A case study of the application of hand-held mobile laser scanning in the planning of an Italian forest (Alpe di Catenaia, Tuscany)*. **Serena Sofia,** Sebastiano Sferlazza, Alessandra Mariottini, Marco Niccolini, Tommaso Coppi, Marcello Miozzo, Tommaso La Mantia, Federico Maetzke.
- **#250** *Updates of 'AW3D30' ALOS global digital surface model in Antarctica with other open access datasets*. **Junichi Takaku,** Takeo Tadono, Masanori Doutsu, Fumi Ohgushi, Hiroki Kai.
- **#257** *Research on key points of quality inspection of aerial photogrammetry results and quality improvement measures*. **Zongbiao Tian,** Miao Li, Linbing Lv, Jin Zhou.
- **#268** *A monte carlo simulation study on the dome effect*. **Riccardo Roncella,** Gianfranco Forlani, Fabrizio Diotri.
- **#269** *Time series analysis for monitoring seagrass habitat and environment in Busuanga, Philippines using Google Earth Engine*. **Ayin Tamondong,** *Takashi Nakamura, T. E*. **Angela Quiros,** Kazuo Nadaoka.
- **#270** *BIM on artificial intelligence for decision support in e-health.* **Bastian Plaß**, Claire Prudhomme, Jean-Jacques Ponciano.
- **#285** 3D *Modelling using Aerial Oblique Images with close range UAV based data for single objects*. **Tomas Orlik,** Eatay Shechter, Gerhard Kemper.
- **#293** *Improving the Internal Accuracy of UAV-Image Blocks using Local Low-Altitude Flights and Scale-Bars*. **Mehdi Maboudi,** Ahmed Elbillehy, Yahya Ghassoun, Markus Gerke.
- **#319** *From survey to 3d modelling to digital fabrication. a workflow aimed at documenting and transmitting built heritage*. **Roberta Spallone,** Maria Concepción López González, Marco Vitali, Giulia Bertola, Fabrizio Natta, Francesca Ronco.

- **#338** *Investigating the performance of a handheld mobile mapping system in different outdoor scenarios*. **Eleonora Maset,** Sara Cucchiaro, Federico Cazorzi, Fabio Crosilla, Andrea Fusiello, Alberto Beinat.
- **#378** *Accuracy validation of tilted camera setups in open skies project and mapping applications*. **Mathias Motz,** Gerhard Kemper**,** Doru Ciobanu.
- **#383** *The combined use of remote sensing and spatial modelling: when surface water impacts african buffalo (syncerus caffer caffer) movements in savanna environments*. **Florent Rumiano,** Cédric Gaucherel, Pascal Degenne, Eve Miguel, Simon Chamaillé-Jammes, Hugo Valls-Fox, Daniel Cornélis, Michel De Garine-Wichatitsky, Hervé Fritz, Alexandre Caron, Annelise Tran.
- **#388** *comparison of multi-image deep-learning super-resolution for passive microwave images of arctic sea ice*. **Xiaofan Shen,** Xiaomin Liu, Yuan Yao, Tiantian Feng.
- **#405** *A review of surge-type glaciers*. **Zixiang Sun,** Gang Qiao.
- **#410** *Boat-based mobile laser scanning for shoreline monitoring of large lakes*. **Danilo Schneider,** Robert Blaskow.
- **#412** *Comparison of pixel-based and feature-based approach for small object change detection*. **Junghoon Seo,** Taejung Kim.
- **#435** *Semantic Segmentation of terrestrial LIDAR data using co-registered RGB data*. **Erick Sanchez Castillo,** David Griffiths, Jan Boehm.
- **#438** *An efficient deep learning approach for ground point filtering in aerial laser scanning point clouds*. **Abdul Awal Md Nurunnabi,** *Felix Norman Teferle, Jonathan Li, Roderik C*. **Lindenbergh,** Addisu Hunegnaw.
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