

2021 digital edition - XXIVth ISPRS Congress Programme (June 7, 2021)

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

Monday 5 July Scientific Track

08:00 - 08:50: Spatial Analysis

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

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 through 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

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 - 11:50: Active Remote Sensing

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 Hagshenas 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 Schmuilius.

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.*

16:30 - 17:20: Sensor Calibration

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.* **Leticia 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**, Jérôme Colin, Sophie Coustance, Peter Kettig, Pablo d'Angelo, Stefan Auer, Georgia Doxani, Camille Desjardins.

17:30 - 18:20: Object Monitoring in Remote Sensing

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

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.

Tuesday 6 July

Scientific Track

08:00 - 08:50: Data integration

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

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 - 10:50: Surface Modelling

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. Ferguson, 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 - 11:50: Hyperspectral Image Processing and Data Fusion

Chairperson: Eija Honkavaara

- TU.4.1: #799 *Piecewise anomaly detection using minimal learning machine for hyperspectral images.* **Anna-Maria Raita-Hakola**, Ilkka Pölonen.
- 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 Laureore, Justin Hyland.

12:30 - 13:30: Keynote Speaker #3

Chairperson: Chen Jun

- **The U.V. Helava Award.** K. Neumann, Kostas Bischiniotis, Christian Heipke. *Recipients: 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.
Recipients: Florent Poux, Roland Billen.
- **Marc Pollefeys (ETH Zürich & Microsoft, Switzerland).** *Computer Vision for Mixed Reality with HoloLens2.*

16:30 - 17:20: 3D Change Detection

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 - 18:20: 3D Instance Detection

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 Mandlbürger, Wilfried Karel, Bruno Wöhrer, Camillo Ressel, 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

Chairperson: Norbert Haala

- TU.7.1: #790 *Weakly supervised pseudo-label assisted learning for 3D 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

Scientific Track

08:00 - 08:50: Education and Outreach

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

Chairpersons: *Ammatzia Peled, Yongnian Zeng*

- 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 - 10:50: Application of Remote Sensing Data

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.

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 Schmillius, 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

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

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**, H el ene Macher, Tania Landes.

18:30 - 19:20: Stereo Matching

Chairperson: Ewelina Rupnik

- WE.7.1: #263 *Mixed probability models for aleatoric uncertainty estimation in the context of dense stereo matching*. **Zeyun Zhong**, Max Mehlretter.
- 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.

Thursday 8 July

Thematic Sessions

08:00 - 08:50: Digital Twins

Chairpersons: Arzu  oltekin (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 Vo ute, 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 Span o.

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 Anghel (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

13:30 - 15:30: 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 Ogori, 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"

- Session 1 : 08:00 - 11:00
- Session 2 : 15:00 - 18:00

ISPRS Geospatial Lecture Day 2021:

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 Mandlbauer (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), Marc Pierrot-Deseilligny (IGN-ENSG, Univ. Gustave Eiffel), 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 oral sessions

Posters

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.
- **#463** *Development and reliability verification of building scale micro population data –case study in Tokyo and Bangkok-.* **Yuki Akiyama**, Hiroyuki Miyazaki, Sirinya Sirikanjanaanan, Kittisak Maneepong.
- **#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 Chiabrande, 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, Gwenaël 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.
- **#167** *Examining changes in the impervious surfaces of urban functional zones and social-economic driving factors of Tianjin, China.* **Shisong Cao**, Yile Cai, Xi Wang, Mingyi Du.
- **#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 Credo, Christelle Jennet, Sophie Fabre.
- **#344** *Automatic change detection of digital maps using aerial images and point clouds.* **Felix Dahle**, Ken Arroyo Ogori, 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, László 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.
- **#464** *High-resolution global urban impervious surface mapping from Sentinel 1A/2 imagery In serve of sustainable development goals.* **Wenjie Du**, Zhongchang Sun, Huadong Guo.
- **#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.
- **#519** *Large-Scale 3D Characterization of Built-up Areas based on TanDEM-X Data.* **Thomas Esch**, Julian Zeidler, Mattia Marconcini, Elisabeth Brzoska, Daniela Palacios-Lopez, Annkatrin Metz-Marconcini, Achim Roth.
- **#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 Salvatore, 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 Detection of Collapsed Buildings with Use of Optical 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.
- **#647** *Evaluation of 3D UAS flight path planning algorithms.* **Paul Debus**, Volker Rodehorst.
- **#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 Boutsis, 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 Iglseeder**, Moritz Bruggisser, Alena Dostálová, Norbert Pfeifer, Stefan Schläffer, 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.
- **#196 Annual dynamics of impervious surfaces in China at 30m resolution derived from multisource satellite images over the past three decades.** **Yinyi Lin**, Hongsheng Zhang, Peifeng Ma.
- **#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 Karsenberg, Shunping Ji, Robert Jentink, Edwin Páree, 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 Mehlretter.
- **#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, Xiaoi 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 Middelman.
- **#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 Ogori, 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.* **Odyseas 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**, Phillip 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 Kandylikis, Aristides D. Vaiopoulos, Konstantinos Karantzas.
- **#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.* **Dorothee 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 Colak**, 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, Dhruva 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 hybrid 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.
- **#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 Fatimah 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 Józków**, 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-decimeter 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. Magalhães, 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, Alihsan 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 Lehmkühl, 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, H  l  ne 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.
- **#580** *New advances in outlining the global settlement extent - the world settlement footprint 2019.* **Mattia Marconcini**, Annekatrin Metz-Marconcini, Thomas Esch, Noel Gorelick.
- **#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,   dson Luis Bolfe, Lucrencio Silvestre Macarringe, Adielson Corr  a 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 lii.
- **#654** *Interactive videos as geospatial interfaces: A case study for regional promotion.* **Matej Zmitko**, Fabian Schwander, Doris Agotai, Arzu   ltekin.
- **#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**, S  bastien Lef  vre.
- **#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.* **H  l  ne 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.

- **#754** *Development of an On-demand Building Mapping System using High-Resolution Satellite Images.* **Hiroyuki Miyazaki**, Satoshi Kaneko, Ryosuke Shibasaki.
- **#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-Rodríguez, 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.
- **#229** *Uncovering the spatiotemporal dynamics of sdg11.3.1 using Earth observation data: a case study of the Beijing-Tianjin-Hebei region, China.* **Meiling Zhou**, Linlin Lu, Huadong Guo, Shuangcheng Zhang, Muhammad Fahad Baqa.
- **#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 Catenai, 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 Cucchiario, 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 Chamailé-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.
- **#442** *Deep Bayesian active learning in high-resolution satellite images for change detection in urban and suburban areas.* **Lemonia Ragia**, Antigoni Panagiotopoulou.
- **#450** *Exploratory spatial analysis of housing prices obtained from web scraping technique.* **Thaís Góes De Souza**, Fernanda Doracy Rocha Fonseca, Vivian De Oliveira Fernandes, Júlio Cesar Pedrassoli.
- **#458** *Research on the network map service technology of remote sensing image intelligent conversion based on gan model.* **Dejin Tang**, Wei Huang, Zhuhua Zha, Jing Yang, Xiaoming Zhou, Cong Wang.

- **#504** *The Setting up of a gis for the general population and housing census.* **Kamel Si Youcef**, Issam Boukerch, Imane Hocine, Aicha Benabdelkader.
- **#510** *Sidewalk detection and pavement characterisation in historic urban environments from point clouds: preliminary results.* **Daniele Treccani**, Lucía Díaz-Vilariño, Andrea Adami.
- **#527** *Landscape Analysis Techniques Applied to a Buddhist Carved Rock Sculpture.* **Giuseppe Salemi**, Emanuela Faresin, Luca Maria Olivieri.
- **#546** *Deforestation detection in the Amazon rainforest with spatial and channel attention mechanisms.* **Pedro Tovar**, Mabel Ortega Adarme, Raul Feitosa.
- **#560** *Integration of data of the remote sensing, GIS, and gamma-spectrometric analysis to study soil material redistribution.* **Lyubov N Trofimetz**, Alexey A Kolesnikov, Evgeny A Panidi, Pavel M Kikin.
- **#602** *Automatic segmentation of point clouds in the architecture environment.* **Rocío Romero - Jarén**, Jose Juan Arranz, Laura Navas-Sánchez, Emrah Erduran, Sandra Martínez-Cuevas, Belén Benito.
- **#604** *UAV photogrammetry and VHR satellite imagery for emergency mapping. The October 2020 flood in Limone Piemonte (Italy).* **Lorenzo Teppati Losè**, Filiberto Chiabrande, Fabio Giulio Tonolo, Andrea Lingua.
- **#608** *Performance of the support vector machine and artificial neural network classifiers for roads identification.* **Alexandre Curvello De Andrade**, Mauro José Alixandrini Jr, Fernanda Puga Dos Santos Carvalho, Vivian De Fernandes.
- **#621** *State-wide Calculation of Terrain-Visualisations and Automatic Map Generation for Archaeological Objects.* **Frank Thiemann**, Malte Schulze, Utz Böhner.
- **#629** *A collaborative platform for water quality monitoring: simile WebGIS.* **Juan Fernando Toro Herrera**, Daniela Carrion, Maria Antonia Brovelli.
- **#634** *Spatio-temporal analysis of land use dynamics and its potential implications on land surface temperature in lahore district, punjab, pakistan.* **Mohammad Sohail**, Syeda Saleha Fatim Ali, Eshrat Fatima, Doost Ali Nawaz.
- **#679** *Google earth engine based agricultural drought monitoring in Kodavanan watershed, part of Amaravathi basin, Tamil Nadu, India.* **Periasamy Thilagaraj**, Palanisamy Masilamani, Ravichandran Venkatesh, Jothiramalingam Killivalavan.
- **#680** *Using MODIS aerosol optical depth to predict PM10 over Al Ain Region, UAE.* **Nazmi Saleous**, Salem Issa, Marwa Al Suwaidi.
- **#685** *Assessment of flooded areas caused by a dam break (sardoba dam, uzbekistan).* **Beste Tavus**, Sultan Kocaman, Candan Gokceoglu.
- **#705** *Improving UAV telemetry positioning for direct photogrammetry.* **Lorenzo Rossi**, Francesco Ioli, Emanuele Capizzi, Livio Pinto, Mirko Reguzzoni.
- **#709** *Application of rail track geometry measuring trolleys for georeferencing of UAV images.* **Vladimir Vasil'Evich Shcherbakov**, Maksim Aleksandrovich Altyntsev, Marina Anatol'Evna Altyntseva.
- **#714** *2-Dimensional Geometric Analysis of a Simple Free Network.* **Bryan Sluis**, Charles Toth.
- **#715** *A comparison of decision tree-based models for forest above-ground biomass estimation using a combination of airborne lidar and landsat data.* **Haifa Tamiminia**, Bahram Salehi, Masoud Mahdianpari, Colin M. Beier, Lucas Johnson, Daniel B. Phoenix.
- **#719** *Groundwater monitoring using grace mission.* **Mohit Shukla**, Vipin Maurya, Ramji Dwivedi.
- **#725** *TLS and short-range photogrammetric data fusion for buildings 3D modeling.* **Paulo Roberto Da Silva Ruiz**, Cláudia Maria De Almeida, Marcos Benedito Schimalski, Veraldo Liesenberg, Edson Aparecido Mitishita.
- **#728** *The Digital Elevation Model Intercomparison eXperiment DEMIX, a community based approach at global DEM benchmarking.* **Peter Strobl**, Conrad Bielski, Peter Guth, Carlos

Grohmann, Jan-Peter Muller, Carlos López-Vázquez, Dean B. Gesch, Giuseppe Amatulli, Serge Riazanoff, Claudia Carabajal.

- **#761** *A case study of pedestrian positioning with UWB and UAV cameras.* **Andrea Masiero**, Paolo Dabove, Vincenzo Di Pietra, Marco Piragnolo, Antonio Vettore, Sara Cucchiaro, Alberto Guarnieri, Paolo Tarolli, Charles Toth, Vassilis Gikas, Harris Perakis, Kai-Wei Chiang, Laura Ruotsalainen, Salil Goel, Jelena Gabela.
- **#770** *Evaluation of Machine Learning Classifiers for Mapping Falcata Plantations in Sentinel-2 Image.* **Jojene Rendon Santillan**, Jun Love E. Gesta.
- **#773** *Promising advances of amazonian monitoring systems throughout vanguard technology and scientific knowledge.* **Luciana Soler**, Daniel Silva, Cassiano Messias, Thiago Carvalho Lima, Juan Doblaz, Bruna Pechini, Jefferson Souza, Douglas Moraes, Claudio Almeida.
- **#778** *Pixel based landslide identification using landsat 8 and gee.* **Pawan Singh**, Vipin Maurya, Ramji Dwivedi.
- **#803** *Evaluating hand-crafted and learning-based features for photogrammetric applications.* **Fabio Remondino**, Fabio Menna, Luca Morelli.
- **#807** *Multispectral and mobile mapping isprs wg iii/5 data set: first analysis of the dataset impact.* **Mattia Previtali**, Manuel Garramone, Marco Scaioni.
- **#815** *New imaging mobile mapping device based on high resolution videogrammetry for large-scale outdoor 3d reconstruction.* **Pedro Ortiz-Coder**, Rubén Cabecera Soriano.
- **#817** *Large-scale subsidence geohazard monitoring with Sentinel-1 SAR Interferometry in central Lishui (China).* **Tengteng Qu**, Zhiman Su, Hongzhen Yang, Xuguo Shi, Weiping Shao.

Interactive poster session #6 (IPS.WE.2): Wednesday July 7 - 14:15 - 15:00

- **#102** *Monitoring of Time-Series Soil Moisture Based on Advanced DInSAR.* **Chia-Hsiang Yang**, Andreas Mütterthies.
- **#124** *Comap: a synthetic dataset for collective multi-agent perception of autonomous driving.* **Yunshuang Yuan**, Monika Sester.
- **#134** *Active reflectors for interferometric sar deformation measurement.* **Yismaw Wassie**, Michele Crosetto, Guido Luzi, Oriol Monserrat, Anna Barra, Riccardo Palamà, María Cuevas-González, S. Mohammad Mirmazloumi, Pedro Espín-López, Bruno Crippa.
- **#138** *Application of UAV oblique photography in real scene 3D modeling.* **Zhou Tihui**, Lv Linbing, Liu Jinhui, Wan Ji.
- **#143** *Mohe-net: monocular object height estimation network using deep learning and scene geometry.* **Jianli Wei**, Jinwei Jiang, Alper Yilmaz.
- **#149** *Mapping of 3D eye-tracking in urban outdoor environments.* **Andreas Kollert**, Martin Rutzinger, Magnus Bremer, Katja Kaufmann, Tabea Bork-Hüffer.
- **#158** *Remote sensing of cities: day and night.* **Qihao Weng**.
- **#194** *Mbs-net: a moving-camera background subtraction network for autonomous driving.* **Jianli Wei**, Jinwei Jiang, Alper Yilmaz.
- **#219** *CNN-based multi-scale hierarchical land use classification for the verification of geospatial databases.* **Chun Yang**, Franz Rottensteiner, Christian Heipke.
- **#228** *Evaluation of tunnel excavation combining terrestrial laser scanning point clouds and design models.* **Yuzhou Zhou**, Zhen Dong, Peiling Tong, Bisheng Yang.
- **#237** *Quality inspection and common issues analysis of 10 meter resolution global land cover data.* **Wen-Jun Xie**, Hai-Peng Chen, Lin-Bing Lyu, Yu-Heng Chen, Miao Li.
- **#243** *Improving lulc classification from satellite imagery using deep learning - eurosat dataset.* **Hadi Yassine**, Kifah Tout, Mohamad Jaber.
- **#254** *An automatic extraction method for Antarctic subglacial lake based on radio echo sounding data.* **Dailiang Wang**, Tiantian Feng, Tong Hao, Rongxing Li.

- **#267** *Mapping coastal and wetland vegetation communities using multi-temporal Sentinel-2 data.* **Paolo Villa**, Claudia Giardino, Simone Mantovani, Deodato Tapete, Antonio Vecoli, Federica Braga.
- **#273** *Scale-awareness for more accurate object detection.* **Vasileios Tsironis**, Christos Stentoumis, Nikos Lekkas, Alex Nikopoulos.
- **#278** *Parametric Modelling Approach to Reconstructing Architectural Indoor Spaces from Point Clouds.* **Wissam Wahbeh**.
- **#309** *Research and engineering practice of emergency geographic information collaborative service mode with crowdsourced data.* **Jing Yang**, Wei Huang, Hongping Zhang, Dejin Tang, Heng Li.
- **#323** *A high-currency geo-spatial service gateway for national geo-information service platform.* **Hongping Zhang**, Wei Huang, Jie Jiang, Mingyi Du, Jing Yang.
- **#328** *Towards learning low-light indoor semantic segmentation with illumination-invariant features.* **Ning Zhang**, Francesco Nex, Norman Kerle, George Vosselman.
- **#332** *Real-time semantic slam with dcnn-based feature point detection, matching and dense point cloud aggregation.* **Boris Vishnyakov**, Ivan Sgibnev, Viktor Sheverdin, Andrey Sorokin, Pavel Masalov, Kirill Kazakhmedov, Sergey Arseev.
- **#351** *Monitoring chlorophyll-a and sea surface temperature with satellite data derived from multiple sensors.* **Aylin Tuzcu Kokal**, Nebiye Musaoğlu.
- **#362** *Design and Implementation of Multi-temporal Image Service System on National Platform for Geospatial Information Services in China.* **Cong Wang**, Hongping Zhang.
- **#370** *Design and implementation of linkage update management system for geo-information service platform.* **Zhuhua Zha**, Huang Wei, Dejin Tang, Cong Wang, Hongping Zhang, Jing Yang, Heng Li.
- **#384** *The use of spectral and textural features in crop type mapping using Sentinel-2A images: A case study, Çukurova Region, Turkey.* **Aylin Tuzcu Kokal**, Filiz Sunar, Adalet Dervisoglu, Suha Berberoglu.
- **#387** *Assessment of combining convolutional neural networks and object based image analysis to land cover classification using Sentinel 2 satellite imagery (Tenes region, Algeria).* **Narimane Zaabar**, Simona Niculescu, Mustapha Kamel Mihoubi.
- **#391** *Multifunctional 3D model for the Farnese Theatre in Parma.* **Andrea Zerbi**, Sandra Mikolajewska.
- **#403** *Evaluation on urban land expansion quality of qingdao city from 2010 to 2018.* **Tao Zhang**, Hailun Dai, Guanghui Wang, Lijuan Zheng, Min Zhang.
- **#407** *Comparison of CryoSat-2 and ICESat-2 on water level monitoring of Nam Co lake.* **Haonan Zhao**, Ruguo Xu, Gang Qiao.
- **#420** *Plastic surgery for 3d city models: a pipeline for automatic geometry refinement and semantic enrichment.* **Olaf Wysocki**, Benedikt Schwab, Ludwig Hoegner, Thomas Heinrich Kolbe, Uwe Stilla.
- **#433** *Object tracking control using a RPAS gimbal mechanism applied to industrial photogrammetry inspection.* **Daniel Juchem Regner**, José Dueñas Salazar, Pedro Vieira Buschinelli, Michael Machado, Diogo Oliveira, João Marcio Santos, Carla Alves Marinho, Tiago Da Costa Pinto.
- **#434** *How to start gentrification process using interferometric stack of Sentinel-1.* **Nur Yagmur**, Esra Erten, Nebiye Musaoglu.
- **#446** *Topology-Aware 3D Modelling of Indoor Spaces from Point Clouds.* **Hossein Zavar**, Hossein Arefi, Shirin Malihi, Mehdi Maboudi.
- **#448** *Monitoring and characterizing long-term variability of urban thermal environment using time-series land cover and remote sensing data.* **George Z Xian**.
- **#449** *Automatic integration of laser scanning and photogrammetric point clouds: from acquisition to co-registration.* **Tahmineh Partovi**, Marc Daehne, Mehdi Maboudi, Daniel Krueger, Markus Gerke.

- **#457** *Analysis the influence of modulated amplitude on common mode error based on GPS data.* **Fan Wang**.
- **#469** *Indoor positioning for smart devices based on sensor fusion with particle filter: localization and map updating.* **Yuan Yang**, Charles Toth.
- **#477** *An inversion approach for biochemical parameters of vegetation based on the prospect-5 model.* **Xuchao Xing**, Xinyan Zheng, Jin Liu.
- **#478** *A Comparison of Machine Learning Models for Soil Salinity Estimation Using Multi-Spectral Earth Observation Data.* **Arastou Zarei**, Mahdi Hasanlou, Masoud Mahdianpari.
- **#486** *Research on quality control method of land cover classification data oriented to national geographic condition monitoring.* **Wenjuan Mao**, Haitao Zhao, Wenchao Gao, Hongjing Tu, Yongmin Xu.
- **#489** *Estimation of Snow Depletion Curve for Gangotri Basin using Multi-Source Remote Sensing Data.* **Prateek Verma**, Sanjay Kumar Ghosh, Raaj Ramsankaran.
- **#492** *A full life data quality workflow research and project practic.* **Haitao Zhao**, Wenchao Gao.
- **#498** *The iPad Pro built-in LiDAR sensor: 3D rapid mapping tests and quality assessment.* **Alessandra Spreafico**, Filiberto Chiabrando, Lorenzo Teppati Losè, Fabio Giulio Tonolo.
- **#524** *Study on the characteristics of Beijing subsidence based on ps-insar/leveling/gnss and primary investigation of the relationship with fault zone.* **Xiao Qing Wang**, Peng Zhang, Yong Shang Wang, Zhan Yi Sun.
- **#541** *Analysis of different polarimetric decomposition techniques using compact polarimetric NISAR data for Ahmedabad, India.* **Anjana Vyas**, Vyjayanthi Nizalapur, Parmit Chhasiya, Darshana Rawal, Gaurav Jain, Anup Kumar Das.
- **#544** *Incremental map refinement of building information using LiDAR point clouds.* **Qianqian Zou**, Monika Sester.
- **#565** *Quality inspection for Block Adjustment of ZY3 Stereo Satellite Imagery.* **Hongjing Tu**, Ying Zhao, Jing Guo, Shibiao Dou, Jin Zhou, Chunxi Chen.
- **#588** *Abnormal crowdsourced data detection using remote sensing image features.* **Xiaoguang Zhou**, Guang Yu, Dongyang Hou, Dongsheng Wei.
- **#601** *Deforestation mapping using Sentinel-1 and object-based Random Forest classification on Google Earth Engine.* **Vasil Yordanov**, Maria Antonia Brovelli.
- **#618** *Terrestrial mobile mapping based on a microwave radar sensor. Application to the localization of mobile robots.* **Raphaël Rouveure**, Patrice Faure, Marie-Odile Monod.
- **#643** *Evaluating different water-land-boundary approximations to improve SAR-derived Digital Elevation Models.* **Bastian Schneider**, Sylvia Schmitz, Eva Wortmeyer, Antje Thiele, Patrick Havel, Holger Dirks.
- **#660** *Radiometric quality assessment for Maxar HD imagery.* **Ilyas Yalcin**, Sultan Kocaman, Sébastien Saunier, Clément Albinet.
- **#661** *Building outline extraction from aerial images and digital surface models with a frame field learning framework.* **Xiaoyu Sun**, Wufan Zhao, Raian V. **Maretto**, Claudio Persello.
- **#677** *Digital elevation models from stereo, video and multi-view imagery captured by small satellites.* **Pablo D'Angelo**, Peter Reinartz.
- **#681** *Exploring cross-city semantic segmentation of ALS point clouds.* **Yuxing Xie**, Konrad Schindler, Jiaojiao Tian, Xiao Xiang Zhu.
- **#703** *3D urban change detection with point cloud siamese networks.* **Iris De Gélis**, Sébastien Lefèvre, Thomas Corpetti.
- **#720** *A novel method for inspection defects in commercial eggs using computer vision.* **Yessica Maria Valencia**, Jhon Jamilton Majin, Victor Taveira, Lucas Ferreira, Marcelo Ricardo Stemmer, Mauricio Edgar Stivanello, Jose Alex Duenas.
- **#743** *Enhancing geometric edge details in mvs reconstruction.* **Elisavet Konstantina Stathopoulou**, Simone Rigon, Roberto Battisti, Fabio Remondino.

- **#752** *Research On Quality Framework Of Real Scene 3D Model Based On Oblique Photogrammetry.* **Yongmin Xu**, Jixian Zhang, Haitao Zhao, Chunxi Chen, Wenjuan Mao.
- **#782** *A novel model for detecting the dynamics of the urban fringe in Harbin City, China.* **Yuan Wang**, Yilong Han, Lijie Pu, Bo Jiang.
- **#802** *State of the art in dense image matching cost computation for high-resolution satellite stereo.* **Yue Wang**, Danchao Gong, Hualong Hu, Shugen Wang, Yilong Han, Yuan Wang, Xiaoliang Ma.
- **#806** *Spatiotemporal change analysis of the protected areas: a case study - iğneada floodplain forests.* **Merve Toker**, Emre Çolak, Filiz Sunar.
- **#810** *An unsupervised method based on fire index enhancement and GRNN for automated burned area mapping from single-period remote sensing imagery.* **Qi Zhang**, Yao Xiao.