

ISPRS Technical Commission II Symposium 2024

"The Role of Photogrammetry for a Sustainable World"
June 11-14, 2024 | Las Vegas, Nevada

Conference Agenda

Session Overview

Date: Tuesday, 11/June/2024

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| 8:00am - | Opening Session Chair: Alper Yilmaz Chair: Jan Dirk Wegner |
| 8:15am | D1 - Keynote: Keynote - Andrea Fusiello |
| 9:00am - | D1M1 - WG1: Image Orientation and Fusion Chair: Petra Helmholtz |
| 10:00am | Procedure for the Orientation of Laser Triangulation Sensors to a Stereo Camera System for the Inline Measurement of Rubber Extrudate S. Albers¹, R. Rofallski¹, P.-F. Hagen², T. Luhmann¹ 1: Institute for Applied Photogrammetry and Geoinformatics, Jade University of Applied Sciences; 2: Institute of Measurement and Control Technology, Leibniz University Hannover |
| | VALIDATION OF CAMERA NETWORKS USED FOR THE ASSESSMENT OF SPEECH MOVEMENTS L. T. Boyle¹, P. Helmholtz¹, D. Lichti², R. Ward³ 1: School of Earth and Planetary Sciences, Curtin University, Australia; 2: Department of Geomatics Engineering, University of Calgary; 3: Curtin School of Allied Health, Curtin University |
| | Triangulated Irregular Network based Seamline Determination for Fast Image Stitching of Multiple UAV Images S.-J. Yoon, T. Kim Inha University, Korea, Republic of (South Korea) |
| | Unleashing Deep Learning based Tie Point Matching for Geometric Processing of Off-Track Satellite Stereo S. Song^{1,2,4}, L. Morelli^{5,6}, X. Wu^{1,3}, R. Qin^{1,2,3,4}, H. Albanwan⁷, F. Remondino⁵ 1: Geospatial Data Analytics Lab, The Ohio State University, Columbus, USA; 2: Department of Civil, Environmental and Geodetic Engineering, The Ohio State University, Columbus, USA; 3: Department of Electrical and Computer Engineering, The Ohio State University, Columbus, USA; 4: Translational Data Analytics Institute, The Ohio State University, Columbus, USA; 5: 3D Optical Metrology (3DOM) Unit, Bruno Kessler Foundation (FBK), Trento, Italy; 6: Department of Civil, Environmental and Mechanical Engineering, University of Trento, Italy; 7: Civil Engineering Department, Kuwait University, Kuwait |
| 10:00am - | D1 - Coffee - Morning |
| 10:30am | D1M2 - WG2: Point Cloud Generation and Processing |
| 10:30am - | UAS Photogrammetry for Precise Digital Elevation Models of Complex Topography: A Strategy Guide M. Elias, S. Isfort, A. Eitner, H.-G. Maas Institute of Photogrammetry and Remote Sensing, TUD Dresden University of Technology, Germany |
| | EXPLOITATION OF THE NUMBER OF RETURN ECHOES FOR DTM EXTRACTION FROM POINT CLOUDS ACQUIRED BY LIDAR UAS DJI ZENMUSE L1 F. Matrone, F. Gallitto, P. F. Maschio, A. M. Lingua Laboratory of Photogrammetry, Geomatics & GIS, Department of Environment, Land and Infrastructures Engineering (DIATI) - Politecnico di Torino, Corso Duca degli Abruzzi 24, 10129 Torino (Italy) |
| | ESTATE: A LARGE DATASET OF UNDER-REPRESENTED URBAN OBJECTS FOR 3D POINT CLOUD CLASSIFICATION O. C. Bayrak^{1,2}, Z. Ma¹, E. M. Farella¹, F. Remondino¹, M. Uzar² 1: 3D Optical Metrology (3DOM) unit, Bruno Kessler Foundation (FBK), Trento, Italy; 2: Dept. of Geomatics Engineering, Faculty of Civil Engineering, Yildiz Technical University, Istanbul, Turkey |
| | Development and Evaluation of a Two-Stage 3D Keypoint Based Workflow for the Co-Registration of Unstructured Multi-Temporal and Multi-Modal 3D Point Clouds S. Isfort, M. Elias, H.-G. Maas Institute of Photogrammetry and Remote Sensing, TUD Dresden University of Technology, Germany |
| 11:30am - | D1M3 - WG7: Underwater Data Acquisition and Processing Chair: Erica Nocerino |
| 12:30pm | UAV-based LiDAR bathymetry at an alpine mountain lake K. Richter, D. Mader, H. Sardemann, H.-G. Maas Dresden University of Technology, Germany |
| | Concepts for compensation of wave effects while measuring through water surfaces in photogrammetric applications C. Mulsow¹, H. Sardemann¹, L.-A. Gueguen², G. Mandelburger², H.-G. Maas¹ 1: TUD Dresden University of Technology, Germany; 2: TU Wien, Austria |

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| | <p>Multimedia Photogrammetry with non-planar Water Surfaces – Accuracy Analysis on Simulation Basis H. Sardemann¹, C. Mulsow¹, L.-A. Gueguen², G. Mandlbürger², H.-G. Maas¹ 1: TUD Dresden University of Technology, Germany; 2: TU Wien, Austria</p> |
| | <p>Deep learning assisted exponential waveform decomposition for bathymetric LiDAR N. Li¹, M.-L. Truong², R. Schwarz¹, M. Pfennigbauer¹, A. Ullrich¹ 1: Riegl Research Forschungs Gesellschaft mbH, Austria; 2: Riegl USA, Inc, USA</p> |
| 12:30pm - 1:45pm | D1 - Lunch |
| 1:45pm - 2:30pm | Keynote - Dalton Lunga |
| 2:30pm - 3:30pm | <p>D1A1 - WG4: ML for Geospatial Data Chair: Rongjun Qin</p> <p>Sat-SINR: High-Resolution Species Distribution Models Through Satellite Imagery J. Dollinger¹, P. Brun², V. S. F. Garnot¹, J. D. Wegner¹ 1: UZH Department for Mathematical Modeling and Machine Learning (DM3L), Switzerland; 2: Swiss Federal Research Institute (WSL), Switzerland</p> |
| | <p>RECTILINEAR BUILDING FOOTPRINT REGULARIZATION USING DEEP LEARNING P. Schuegraf¹, J. Tian¹, Z. Li², J. Shan², K. Bittner¹ 1: Deutsches Zentrum für Luft- und Raumfahrt, Germany; 2: Purdue University, Indiana, US</p> |
| | <p>VEHICLE GEOLOCALIZATION FROM DRONE IMAGERY D. Novikov¹, P. Sotirelis², A. Yilmaz³ 1: Weizmann Institute of Science, Israel; 2: AFRL/RYP, United States of America; 3: The Ohio State University, United States of America</p> |
| | <p>Performance analysis of Bayesian optimised gradient-boosted decision trees for digital elevation model (DEM) error correction C. J. Okolie^{1,2,3}, A. K. Adeleke⁴, J. L. Smit⁵, J. P. Mills³, C. O. Ogbeta⁶, I. D. Maduako⁷ 1: Division of Geomatics, University of Cape Town, South Africa; 2: Department of Surveying & Geoinformatics, University of Lagos, Nigeria; 3: School of Engineering, Newcastle University, United Kingdom; 4: Department of Geography, Geoinformatics and Meteorology, University of Pretoria, South Africa; 5: Department of Civil Engineering and Geomatics, Cape Peninsula University of Technology, South Africa; 6: Geomatics Lab, School of Civil and Construction Engineering, Oregon State University, USA; 7: Department of Geoinformatics and Surveying, University of Nigeria, Nsukka, Nigeria</p> |
| 3:30pm - 4:00pm | D1 - Coffee - Afternoon |
| 4:00pm - 5:00pm | <p>D1A2 - WG3: 3D scene reconstruction for modeling & mapping Chair: Ksenia Bittner Chair: Franz Rottensteiner</p> <p>DEPTH-AWARE PANOPTIC SEGMENTATION T. Nguyen, M. Mehlretter, F. Rottensteiner Institute of Photogrammetry and Geoinformation, Leibniz University Hannover, Germany</p> |
| | <p>Deep Learning-based DSM Generation from Dual-Aspect SAR Data M. Recla, M. Schmitt University of the Bundeswehr Munich, Germany</p> |
| | <p>REAL-GDSR: Real-World Guided DSM Super-Resolution via Edge-Enhancing Residual Network D. Panangian, K. Bittner German Aerospace Center (DLR), Germany</p> |
| | <p>Large-Scale 3D Terrain Reconstruction Using 3D Gaussian Splatting for Visualization and Simulation M. Chen¹, D. Lal¹, Z. Yu², J. Xu¹, A. Feng¹, S. You³, A. Nurunnabi⁴, Y. Shi⁵ 1: USC Institute for Creative Technologies, United States of America; 2: Arizona State University, United States of America; 3: DEVCOM Army Research Laboratory; 4: University of Luxembourg, Luxembourg; 5: Colorado School of Mines, United States of America</p> |
| 6:00pm - 7:00pm | Reception: Reception |

Date: Wednesday, 12/June/2024

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| 8:15am - 9:00am | D1 - Keynote - Tanya Birch |
| 9:00am - 10:00am | D2M1 - WG8: Environmental & Infrastructure Monitoring Chair: Zhenfeng Shao Chair: Nives Grasso Algorithm, Progresses, Datasets and Validation of GLC_FCS30D: the first global 30 m land-cover dynamic product with fine classification system from 1985 to 2022 L. Liu, X. Zhang Aerospace Information Research Institute, CAS, China STRUCTURAL HEALTH MONITORING OF BRIDGES WITH PERSONAL LASER SCANNING: SEGMENT-BASED ANALYSIS OF SYSTEMATIC POINT CLOUD DEFORMATIONS R. Blaskow, H.-G. Maas Dresden University of Technology, Germany Open-source automatic extraction of Urban Green Space: Application to assessing improvement in green space access I. Estacio¹, C. Lim², J. Hoover³, C. Román-Palacios⁴ 1: Arizona Institute for Resilience, University of Arizona, Tucson 85721, USA; 2: College of Public Health, University of Arizona, Tucson 85721, USA; 3: College of Agriculture, Life & Environmental Sciences, University of Arizona, Tucson 85721, USA; 4: School of Information, University of Arizona, Tucson 85721, USA Machine Learning Approaches for Vehicle Counting on Bridges Based on Global Ground-Based Radar Data M. Arnold¹, S. Keller² 1: ci-tec GmbH, Germany; 2: Institute of Photogrammetry and Remote Sensing, Karlsruhe Institute of Technology, 76131 Karlsruhe, Germany |
| 10:00am - 10:30am | D2 - Coffee - Morning |
| 10:30am - 11:30am | D2M2 - WG5: Temporal Geospatial Data Understanding Chair: Charlotte Pelletier Chair: Jan Dirk Wegner Forecasting water resource from satellite image time series using a graph-based learning strategy C. Dufourg¹, C. Pelletier¹, S. May², S. Lefèvre¹ 1: Université Bretagne Sud, IRISA, UMR CNRS 6074, Vannes, France; 2: Centre National d'Etudes Spatiales (CNES), Toulouse, France Crowd Scene Anomaly Detection in Online Videos K. Yang, A. Yilmaz Photogrammetric Computer Vision Lab at The Ohio State University, United States of America Occlusion handling in spatio-temporal object-based image sequence matching S. Nietiedt¹, P. Helmholz², T. Luhmann¹ 1: Institute for Applied Photogrammetry and Geoinformatics, Jade University of Applied Sciences, Germany; 2: Spatial Sciences, School of Earth and Planetary Sciences, Curtin University, Australia ZERO-SHOT BUILDING AGE CLASSIFICATION FROM FACADE IMAGE USING GPT-4 Z. Zeng¹, J. M. Goo¹, X. Wang¹, B. Chi², M. Wang¹, J. Boehm¹ 1: Department of Civil, Environmental and Geomatic Engineering, University College London, United Kingdom; 2: Department of Geography, University College London, United Kingdom |
| 11:30am - 12:30pm | D2M3 - WG6: Innovating Heritage Preservation: Remote Sensing & Photogrammetry A novel hyperspectral salt assessment model for weathering in architectural ruins Y. Ren^{1,2}, F. Liu^{1,2} 1: School of Geomatics and Urban Information, Beijing University of Civil Engineering and Architecture, China, People's Republic of; 2: Key laboratory of Modern Urban Surveying and Mapping, National Administration of Surveying, Mapping and Geoinformation Remote sensing of archaeological relics in Arabia revealing a wetting paleo climate M. Hereher Sultan Qaboos University, Oman Large Scale and Complex Structure Grotto Digitalization Using Photogrammetric Method: A Case Study of Cave No. 13 in Yungang Grottoes H. Xiang^{1,2,5}, W. Niu^{1,2,5}, X. Huang^{1,2,4,5}, B. Ning³, F. Zhang^{1,2,4,5}, J. Xu⁵ 1: State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, China; 2: Intelligent Computing Laboratory for Cultural Heritage, Wuhan University, China; 3: Yungang Research Institute, Shanxi, China; 4: Archaeological Institute for Yangtze Civilization, Wuhan University, China; 5: Daspatial Technology Co., LTD, Wuhan, China An Archival Framework for Re-Use of Cultural Heritage 3D Survey Data: OpenHeritage3D.org S. McAvoy¹, B. Tanduo², A. Spreafico², F. Chiabrando², D. Rissolo¹, J. Ristevski³, F. Kuester¹ 1: Cultural Heritage Engineering Initiative, University of California San Diego; 2: Laboratory of Geomatics for Cultural Heritage (LabG4CH), Department of Architecture and Design (DAD), Polytechnic University of Turin; 3: CyArk |
| 12:30pm - 2:30pm | D2 - Lunch + Poster: D2 - Lunch (12:30AM - 1:45PM) + Poster I (12:30AM - 2:30PM) Machine Learning-Based Gap Filling for Sentinel-2 NDVI Time Series and Comparison with Drone Imagery NDVI Y. Youn, Y. Lee Pukyong National University, Korea, Republic of (South Korea) Ground vehicle path planning on Uneven terrain Using UAV Measurement point clouds K. Otomo, K. Ishikawa Nippon Institute of Technology, Japan Mobile Mapping System for Point Clouds acquisition in a forest environment with Action Cameras A. Pinhal¹, J. A. Gonçalves^{1,2} 1: DGAOT, Faculty of Sciences of the University of Porto (FCUP), Portugal; 2: CIIMAR - Terminal de Cruzeiros de Leixões, 4450-208 Matosinhos, Portugal |

Multi-Sensor Data Integration for improved Topographic and Tree Surveys: Integrating Traditional Surveying, Photogrammetry, LiDAR, and Sonar

R. Tamimi, C. Toth

The Ohio State University, United States of America

A Review on End-to-End High-Definition Map Generation

J. Kwag, C. Toth

Ohio State University, United States of America

A Multimodal Approach to Rapidly Documenting and Visualizing Archaeological Caves in Quintana Roo, Mexico

D. Rissolo¹, S. McAvoy¹, H. Barba Meinecke², H. Moyes³, S. Meacham⁴, J. Fortin⁴, F. Devos⁴, F. Kuester¹

1: University of California, San Diego, United States of America; 2: Subdireccion de Arqueologia Subacuatica, INAH; 3: University of California, Merced; 4: Centro Investigador del Sistema Acuifero de Quintana Roo

OPTIMIZATION OF TEXTURE RENDERING OF 3D BUILDING MODEL BASED ON VERTEX IMPORTANCE

W. Shen, L. Huo, T. Shen

Beijing University of Civil Engineering and Architecture, Daxing District, Beijing, China, People's Republic of

Advancing Coral Structural Connectivity Analysis through Deep Learning and Remote Sensing: A Case Study of South Pacific Tetiaroa Island

Y. Zhang¹, J. Qin², M. Li³, Q. Han⁴, A. Gruen³, D. Li², J. Zhong²

1: School of Emergency Management and Safety Engineering, China University of Mining & Technology, Beijing; 2: State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University; 3: Institute of Geodesy and Photogrammetry, ETH Zurich; 4: Department of Landscape Architecture, Nanjing Agricultural University

Diurnal hourly near-surface ozone concentration derived from Himawari-8 in China

Y. Zhang¹, L. Zang², J. Song¹, J. Yang¹, J. Chen¹, F. Mao¹

1: Wuhan University, China, People's Republic of; 2: Chinese Antarctic Center of Surveying and Mapping, Wuhan University, China, People's Republic of

The Potential of Night-time Observations by Using Unmanned Aerial Vehicles (UAV) Imagery

L. Mandaya¹, J.-Y. Rau¹, M. Ramli²

1: National Cheng Kung University, Taiwan; 2: Bosowa University, Indonesia

Practical Techniques for Vision-Language Segmentation Model in Remote Sensing

Y. Lin, K. Suzuki, S. Sogo

Kokusai Kogyo Co., Ltd.

Land Cover Segmentation Method Based on Heterogeneous Data and Channel-Related Deep Learning

Z. Li¹, Y. Li², P. Zhang¹

1: CBAS, Aerospace Information Research Institute, CAS, China, People's Republic of; 2: College of Resources and Environment, University of CAS, China, People's Republic of

COMPARISON OF MACHINE LEARNING AND STATISTICAL APPROACHES FOR DIGITAL ELEVATION MODEL (DEM) CORRECTION: INTERIM RESULTS

C. Okolie^{1,2,3}, A. Adeleke⁴, J. Smit⁵, J. Mills³, I. Maduako⁶, C. Ogbeta⁷

1: Division of Geomatics, University of Cape Town, South Africa; 2: Department of Surveying & Geoinformatics, University of Lagos, Nigeria; 3: School of Engineering, Newcastle University, United Kingdom; 4: Department of Geography, Geoinformatics and Meteorology, University of Pretoria, South Africa; 5: Department of Civil Engineering and Geomatics, Cape Peninsula University of Technology, South Africa; 6: Department of Geoinformatics and Surveying, University of Nigeria, Nsukka, Nigeria; 7: Geomatics Lab, School of Civil and Construction Engineering, Oregon State University, USA

Old- and New-Generation Hyperspectral Sensors to Classify and Characterize Agricultural Crops

L. P. Anece¹, P. S. Thenkabail¹, P. Teluguntla^{1,2}, A. J. Oliphant¹, D. J. Foley¹, R. L. McCormick¹

1: U.S. Geological Survey, United States of America; 2: Bay Area Environmental Research Institute

Identifying and predicting climate change impact on vector-borne disease using machine learning: Case study of Plasmodium falciparum from Africa

P. Singh

UPES, India

Super Resolution for True Pairwise Stereo Satellite Images

Y. Ye

The Ohio State University, United States of America

Exploring the Efficacy of UAV Multispectral Imaging for Downy Mildew Detection in Vineyards

K. Musungu, P. Duncan

Cape Peninsula University of Technology, South Africa

LUOJIA Explorer PMS: Panoramic Odometry and Mapping with Structural Information

Y. Xu^{1,2,3}, C. Chen^{1,2,3}, B. Yang^{1,2,3}, L. Li⁴, Z. Wang^{1,2,3}, S. Sun^{1,2,3}, Z. Yan^{1,2,3}, S. Wu^{1,2,3}

1: State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, Wuhan 430079, China; 2: Engineering Research Center for Spatio-temporal Data Smart Acquisition and Application, Ministry of Education of China, Wuhan University, Wuhan 430079, China; 3: Institute of Geo-spatial intelligence, Wuhan University, Wuhan 430079, China; 4: Institute of Artificial Intelligence, School of Computer Science, Wuhan University, Wuhan 430079, China

Convolutional Neural Networks for Road Detection: An Unsupervised Domain Adaptation Approach

G. R. Collegio¹, A. P. Dal Poz¹, A. G. G. Filho², A. Habib³

1: Department of Cartography, Faculty of Sciences and Technology, Sao Paulo State University (UNESP); 2: DSG, Brazilian Army Geographic Service; 3: Lyles School of Civil Engineering, Purdue University

COMPARATIVE EVALUATION OF NERF ALGORITHMS ON SINGLE IMAGE DATASET FOR 3D RECONSTRUCTION

F. Condorelli¹, M. Perticarini²

1: Free University of Bozen, Italy; 2: University of Padua

Regional Adaptive Swapping and Mixing-Based Data Augmentation for Semantic Segmentation of Outdoor Point Clouds

Z. Zhang, L. Shi

Capital Normal University, China, People's Republic of

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| | <p>Application Model of Hyperspectral Technology Based on Novel Spectral Indices for Salinity Assessment in Soil Heritage Sites F. Liu^{1,2}, Y. Ren^{1,2} 1: School of Geomatics and Urban Information, Beijing University of Civil Engineering and Architecture, China, People's Republic of; 2: Key laboratory of Modern Urban Surveying and Mapping. National Administration of Surveying, Mapping and Geoinformation</p> |
| | <p>3D BUILDING CHANGE DETECTION DRIVEN BY 2D IMAGE CHANGES Y. Zhang^{1,2,3}, J. Chai^{1,2}, S. Chen^{1,2}, Z. Zou² 1: National Engineering Research Center of High-Speed Railway Construction Technology, China, People's Republic of; 2: Central South University, China, People's Republic of; 3: Powerchina Zhongnan Engineering Corporation Limited, China, People's Republic of</p> |
| | <p>SEMANTIC SEGMENTATION OF AERIAL LIDAR POINT CLOUDS BASED ON JOINT SYNTHETIC POINT CLOUDS R. Zhang^{1,2}, Y. Zhang^{1,2,3}, X. Wang^{1,2}, S. Chen^{1,2} 1: National Engineering Research Center of High-Speed Railway Construction Technology, China, People's Republic of; 2: Central South University, China, People's Republic of; 3: Powerchina Zhongnan Engineering Corporation Limited, China, People's Republic of</p> |
| | <p>3D RECONSTRUCTION OF NEURAL IMPLICIT REPRESENTATIONS BASED ON OCTREE VOXEL GUIDANCE J. Wu^{1,2}, Y. Zhang^{1,2,3}, X. Yang², Y. Li² 1: National Engineering Research Center of High-Speed Railway Construction Technology, China, People's Republic of; 2: Central South University, China, People's Republic of; 3: Powerchina Zhongnan Engineering Corporation Limited, China, People's Republic of</p> |
| | <p>Rethinking Temporal Correlation in Deep Learning-based Remote Sensing Change Detection H. Guo¹, B. Du³, X. Su², C. Wu¹, L. Zhang¹ 1: State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University; 2: School of Remote Sensing and Information Engineering, Wuhan University, Wuhan, China; 3: School of Computer Science, Wuhan University, Wuhan, China</p> |
| | <p>Three-dimensional modelling of artificial caves for geomechanical analysis A. Spadaro¹, M. Piras¹, N. Grasso¹, P. Lollino², A. Parisi³, D. Giordan⁴ 1: Dept. of Environment, Land and Infrastructure Engineering (DIATI), Politecnico di Torino, Turin, Italy; 2: Dept. of Earth and Geoenvironmental Sciences, University of Bari, Bari, Italy; 3: Association "Gravina Sotterranea" – Geophysical Applications Processing - GAP s.r.l., Bari, Italy; 4: Research Institute for Geo-hydrological Protection (IRPI), Italian National Research Council, Turin, Italy</p> |
| 2:30pm | D2A1 - WG2: Point Cloud Generation and Processing |
| 3:30pm | <p>Airborne LiDAR Point Cloud Filtering Algorithm Based on Supervoxel Ground Saliency W. Fan, X. Liu, Y. Zhang, D. Yue, S. Wang, J. Zhong School of Remote Sensing and Information Engineering, Wuhan University, 430079 Wuhan, China</p> |
| | <p>An End-to-End Geometric Characterization-aware Semantic Instance Completion Network for ALS point clouds J. Wang, W. Yao The Hong Kong Polytechnic University, Hong Kong S.A.R. (China)</p> |
| | <p>LAND MOVEMENT DETECTION FROM UAV IMAGES FOR A SUSTAINABLE WORLD P. C. Pesántez-Cabrera Universidad Católica de Cuenca, Ecuador</p> |
| | <p>AUTOMATIC VECTORIZATION OF POWER LINES FROM AIRBORNE LIDAR POINT CLOUDS E. Maset, A. Fusiello University of Udine, Italy</p> |
| 3:30pm | D2 - Coffee - Afternoon |
| 4:00pm | |
| 4:00pm | <p>D2A2 - WG7: Underwater Data Acquisition and Processing Chair: Fabio Menna Chair: Christian Mulsow</p> |
| 5:00pm | <p>POSER: an oPen sOURCE Simulation platform for tEaching and tRaining underwater photogrammetry F. Menna¹, S. McAvoy², E. Nocerino³, B. Tanduo⁴, L. Giuseffi⁵, A. Calantropio³, F. Chiabrando⁴, L. Teppati Losé⁴, A. M. Lingua⁶, S. Sandin⁷, C. Edwards⁷, B. Zgliczynski⁷, D. Rissolo², F. Kuester² 1: Fondazione Bruno Kessler - 3D Optical Metrology Unit (3DOM), Trento, Italy; 2: University of San Diego California, Cultural Heritage Engineering Initiative (CHEI), La Jolla, CA, USA; 3: Department of Humanities and Social Sciences, University of Sassari, Sassari, Italy; 4: Department of Architecture and Design, Politecnico di Torino, Torino, Italy; 5: National Oceanic and Atmospheric Administration, Southwest Fisheries Science Center, La Jolla, CA, USA; 6: Department of Environment, Land and Infrastructure Engineering, Politecnico di Torino, Torino, Italy; 7: University of San Diego California, Scripps Institution of Oceanography, La Jolla, CA, USA</p> |
| | <p>UNDER AND THROUGH WATER DATASETS FOR GEOSPATIAL STUDIES: THE 2023 ISPRS SCIENTIFIC INITIATIVE "NAUTILUS" A. Calantropio¹, F. Menna², D. Skarlatos³, C. Balletti⁴, G. Mandlbürger⁵, P. Agrafiotis⁶, F. Chiabrando⁷, A. M. Lingua⁸, A. Giaquinto⁹, E. Nocerino¹ 1: Department of humanities and social sciences, University of Sassari, Sassari, Italy; 2: 3D Optical Metrology (3DOM) unit, Bruno Kessler Foundation (FBK), Trento, Italy; 3: Photogrammetric Vision Lab, Cyprus University of Technology, Limassol, Cyprus; 4: Laboratorio di fotogrammetria CIRCE, Università luav di Venezia, Venezia, Italy; 5: Department of Geodesy and Geoinformation, TU Wien, Wien, Austria; 6: Faculty of Electrical Engineering and Computer Science, Technische Universität Berlin, Germany; 7: Department of Architecture and Design, Politecnico di Torino, Torino, Italy; 8: Department of Environment, Land and Infrastructure Engineering, Politecnico di Torino, Torino, Italy; 9: Department of Sciences and Technologies, University Parthenope of Naples, Italy</p> |
| | <p>APPLICATION OF PHOTOGRAMMETRIC COMPUTER VISION AND DEEP LEARNING IN HIGH-RESOLUTION UNDERWATER MAPPING: A CASE STUDY OF SHALLOW-WATER CORAL REEFS J. Zhong¹, M. Li^{1,2}, A. Gruen², J. Gong¹, D. Li¹, M. Li³, J. Qin¹ 1: State Key Laboratory of Information Engineering in Surveying Mapping and Remote Sensing, Wuhan University, Wuhan 430079, China; 2: Institute of Geodesy and Photogrammetry, ETH Zurich, 8093 Zurich, Switzerland; 3: South China Sea Development Research Institute, Ministry of Natural Resources, Guangzhou 510310, China</p> |
| | <p>Integrating widespread coral reef monitoring tools for managing both area and point annotations G. Pavoni¹, J. Pierce², C. Edwards², M. Corsini¹, V. Petrovic³, P. Cignoni¹ 1: ISTI-CNR, Italy; 2: CSS Inc., Under contract to NOAA, National Ocean Service, National Centers for Coastal Ocean Science; 3: Computer Science and Engineering, University of California, San Diego</p> |
| 5:00pm | ISPRS TCII Meeting: ISPRS TCII Meeting (Close Session) |
| 6:00pm | Chair: Alper Yilmaz |

Date: Thursday, 13/June/2024

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| 8:15am - 9:00am | Keynote - Hannah Kerner |
| 9:00am - 10:00am | D3M1 - [WG3 + WG4 + ICWGI]: Advanced approaches in 3D navigation and mapping Chair: Martin Weinmann Chair: Max Mehlretter A Probabilistic-based Drift Correction Module for Visual Inertial SLAMs P. Navard¹, A. Yilmaz² 1: The Ohio State University; 2: The Ohio State University A METHOD FOR ROOF WIREFRAME RECONSTRUCTION BASED ON SELF-SUPERVISED PRETRAINING H. Yang, S. Huang, R. Wang University of Calgary, Canada From research to production: radiometric block adjustment to automate and improve tonal modification of airborne image orthophoto production L. Markelin, M. Sippo, P. Leiso, E. Honkavaara National Land Survey, Finland SEPARATE AND INTEGRATED DATA PROCESSING FOR THE 3D RECONSTRUCTION OF A COMPLEX ARCHITECTURE M. Medici¹, A. Sterpin¹, S. Settimo¹, G. Perda², E. M. Farella², F. Remondino² 1: INCEPTION, Italy; 2: Fondazione Bruno Kessler, Italy |
| 10:00am - 10:30am | D3 - Coffee - Morning |
| 10:30am - 11:30am | D3M2 - WG7: Underwater Data Acquisition and Processing Chair: Erica Nocerino Evaluation of the accuracy of photogrammetric reconstruction of bathymetry using differential GNSS synchronized with an underwater camera E. Lo¹, N. Hui¹, H. Lozano Bravo¹, E. Nocerino², F. Menna³, D. Rissolo¹, F. Kuester¹ 1: Cultural Heritage Engineering Initiative, University of California San Diego, United States of America; 2: Department of Humanities and Social Sciences, University of Sassari, Sassari, Italy; 3: 3D Optical Metrology (3DOM) unit, Bruno Kessler Foundation (FBK), Trento, Italy HIGH-ACCURACY HEIGHT DIFFERENCES USING A PRESSURE SENSOR FOR GROUND CONTROL POINTS MEASUREMENT IN UNDERWATER PHOTOGRAMMETRY F. Menna¹, E. Nocerino², A. Calantropio² 1: Fondazione Bruno Kessler - 3D Optical Metrology Unit (3DOM), Trento, Italy; 2: Department of Humanities and Social Sciences, University of Sassari, Italy High-detail low-cost underwater inspection of large-scale hydropower dams M. Groemer¹, E. Nocerino², A. Calantropio², F. Menna³, A. Dreier⁴, L. Winiwarter⁵, G. Mandlbürger⁶ 1: TU Wien & Verbund Hydropower GmbH, Austria; 2: Department of Humanities and Social Sciences, University of Sassari, Sassari, Italy; 3: 3D Optical Metrology (3DOM) unit, Bruno Kessler Foundation (FBK), Trento, Italy; 4: Department of Geodesy and Geoinformation, Universität Bonn, Bonn, Germany; 5: Faculty of Engineering Sciences, University of Innsbruck, Innsbruck, Austria; 6: Department of Geodesy and Geoinformation, TU Wien, Vienna, Austria Lighting Model for Underwater Photogrammetric Captures N. Hui, E. Lo, D. Rissolo, F. Kuester UC San Diego, United States of America |
| 11:30am - 12:30pm | D3M3 - [WG6 + WG7]: Advances in Photogrammetry in Dynamic Environments Chair: Fabio Menna Multimedia Photogrammetry for Automated 3D Monitoring in Archaeological Waterlogged Wood Conservation R. Rofalski¹, A. Colson², T. Luhmann¹ 1: Jade University of Applied Sciences, Germany; 2: Denkmal3D, Germany THE LEGACY OF SYCAMORE GAP: THE POTENTIAL OF PHOTOGRAMMETRIC AI FOR REVERSE ENGINEERING LOST HERITAGE L. Morelli^{1,2}, G. Mazzacca^{1,3}, F. Ioli⁴, F. Remondino¹, J. Mills⁵ 1: 3D Optical Metrology (3DOM) unit, Bruno Kessler Foundation, Trento, Italy; 2: Dept. of Civil, Environmental and Mechanical Engineering, University of Trento, Italy; 3: Dept. Mathematics, Computer Science and Physics, University of Udine, Italy; 4: Dept. of Civil and Environmental Engineering, Politecnico di Milano, Italy; 5: School of Engineering, Newcastle University, United Kingdom QUANTITATIVE EVALUATION OF COLOR ENHANCEMENT METHODS FOR UNDERWATER PHOTOGRAMMETRY IN VERY SHALLOW WATER: A CASE STUDY A. Calantropio¹, F. Chiabrando², F. Menna³, E. Nocerino¹ 1: Department of Humanities and Social Sciences, University of Sassari, Sassari, Italy; 2: Department of Architecture and Design, Politecnico di Torino, Torino, Italy; 3: 3D Optical Metrology (3DOM) unit, Bruno Kessler Foundation (FBK), Trento, Italy Evaluation of active and passive UAV-based surveying systems for Eulittoral zone mapping R. Arav¹, C. Ressi¹, R. Weiss², T. Artz², G. Mandlbürger¹ 1: Dept. of Geodesy and Geoinformation, TU Wien, Austria; 2: Federal Institute of Hydrology (BfG), Koblenz, Germany |
| 12:30pm - 1:45pm | D3 - Lunch + Poster: D3 - Lunch + Poster II INVESTIGATION INTO CAMERA CALIBRATION PROCEDURES FOR UAV-BASED CORRIDOR SURVEYS J. Henharen, P. Helmholz Spatial Science, EPS, Curtin University, GPO Box U1987, Perth WA 6845, Australia Automated Registration Of Full Moon Remote Sensing Images Based On Triangulated Network Constraints H. Ge^{1,2}, Y. Geng³, X. Ba¹, Y. Wang¹, J. Lv³ 1: Piesat Information Technology Co., Ltd; 2: School of Computer Science, Northwestern Polytechnical University; 3: Beijing University of Civil Engineering and Architecture Monitoring time-varying changes of historic structures through photogrammetry-driven digital twinning |

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| | <p>X. Kong California State University, Fresno, United States of America</p> <hr/> <p>NOVEL APPROACHES FOR ALIGNING GEOSPATIAL VECTOR MAPS M. A. Cherif¹, S. Tripodi², Y. Tarabalka², I. Manighetti¹, L. Laureo² 1: Géoazur, Université Côte d'Azur, France; 2: Luxcarta, France</p> <hr/> <p>Real-time 3D Point Cloud Generation from UAV Images based on GPU Acceleration and Parallel Processing L. Chen, B. Wu, R. Duan Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University, Hong Kong S.A.R. (China)</p> <hr/> <p>Determining Linear Coral Growth Using Photogrammetry and Alternative Point Cloud Comparison Methods P. Helmholtz¹, T. Bassett², L. Boyle¹, N. Browne³, I. Parnum¹, M. Moustaka^{4,5,6}, R. Evans^{5,6} 1: School of Earth and Planetary Sciences, Spatial Sciences, Curtin University, GPO Box U1987, Perth WA 6845, Australia; 2: School of Molecular and Life Sciences, Curtin University, GPO Box U1987, Perth WA 6845, Australia; 3: School of the Environment, University of Queensland, St Lucia, QLD, 4072, Australia; 4: School of Biological Sciences, The University of Western Australia, Perth, WA, 6009, Australia; 5: The Oceans Institute, The University of Western Australia, Perth, WA, 6009, Australia; 6: Marine Science Program, Biodiversity and Conservation Science, Department of Biodiversity, Conservation and Attractions, Kensington, WA, 6151, Australia</p> <hr/> <p>Development of a Precise Tree Structure from Lidar Point Clouds A. A. M. Nurunnabi^{1,2}, F. Teferle¹, D. F. Laefer³, M. Chen⁴, M. M. Ali⁵ 1: University of Luxembourg, Luxembourg; 2: Institute for Advanced Studies (IAS), University of Luxembourg, Luxembourg; 3: New York University, USA; 4: University of Southern California, USA; 5: Ball State University, USA</p> <hr/> <p>Extraction of block walls from point clouds measured by Mobile Mapping System T. Odaka¹, H. Harada¹, K. Otomo¹, K. Ishikawa² 1: Dept. of Mechanical Systems Engineering, Graduate School, Nippon Institute of Technology, Saitama, Japan; 2: Dept. of Mechanical Engineering, Nippon Institute of Technology, Saitama, Japan</p> <hr/> <p>MEGA Vision: Integrating Reef Photogrammetry Data into Immersive Mixed Reality Experiences J. H. R. Burns^{1,2}, K. H. Pascoe^{1,3}, C. Kapon^{1,3}, H. Kane^{1,4}, A. Spengler^{1,2} 1: MEGA Lab, Hilo HI 96720, USA; 2: Marine Science, Data Science, and Tropical Conservation Biology and Environmental Science, College of Natural and Health Sciences, University of Hawai'i at Hilo, Hilo HI 96720, USA; 3: Center for Global Discovery and Conservation Science, Arizona State University, Hilo HI 96720, USA; 4: School of Ocean & Earth Science & Technology University of Hawai'i 1680 East West Rd. Honolulu, HI 96822 USA</p> <hr/> <p>Creating a Reference Point Cloud for Future Testing Wearable Mobile Mapping Systems to Support Cultural Heritage Preservation A. D. Ladai¹, C. Toth² 1: Norwegian University of Science and Technology, Norway; 2: The Ohio State University</p> <hr/> <p>A STUDY ON SPATIAL DIFFERENTIATION OF LANDSCAPE PATTERN BASED ON THREE-DIMENSIONAL MORPHOLOGY OF URBAN BUILDINGS M. Zhang, T. Shen, L. Huo, Y. Li, W. Shen Beijing University of Civil Engineering and Architecture</p> <hr/> <p>Underground LiDAR-based SLAM using wire restrictions Z. Xu, Y. Li, J. Wu, J. Lin China University of Mining and Technology, Beijing</p> <hr/> <p>Integrating Crowd-sourced Annotations of Tree Crowns using Markov Random Field and Multispectral Information. Q. Mei, J. Steier, D. Iwaszczuk Technical University of Darmstadt, Germany</p> |
| 1:45pm - | Keynote - Konstantinos Karantzal |
| 2:30pm - | D3A1 - WG8: Environmental & Infrastructure Monitoring Chair: Zhenfeng Shao Chair: Nives Grasso |
| 3:30pm | <p>MULTI-TEMPORAL SfM: A FLEXIBLE TOOL ABLE TO COPE WITH AERIAL PHOTOGRAMMETRIC DATASETS IN CHANGING ENVIRONMENTS M. Scaioni¹, R. Eskandari¹, N. Genzano¹, D. Fugazza² 1: Politecnico di Milano - Dept. of Architecture, Built Environment and Construction Engineering (DABC), Italy; 2: Università degli Studi di Milano - Dept. of Environmental Science and Policy (DESP), Italy</p> <hr/> <p>Investigating the potential of hyper-temporal terrestrial laser point clouds for monitoring deciduous tree growth S. Boehme, A. Bienert, K. Richter, H.-G. Maas Technische Universität Dresden, Germany</p> <hr/> <p>DISTRESS DETECTION IN URBAN PAVEMENTS: AN ANALYSIS OF VARYING UAV ALTITUDES L. Inzerillo, F. Acuto, A. Pisciotto, K. Mantalovas, G. Di mino Department of Engineering, University of Palermo</p> <hr/> <p>Integrated Index and Remote Sensing generated to evaluated and monitoring post forest fires in Semi-Arid Land in Algeria A. zegrar, N. Bentekhici Centre of Spatial Techniques</p> |
| 3:30pm - | D3 - Coffee - Afternoon |
| 4:00pm - | D3A2 - WG2: Point Cloud Generation and Processing |
| 5:00pm | <p>Efficient Calculation of Multi-Scale Features for MMS Point Clouds K. Hiraoka¹, G. Takahashi², H. Masuda¹ 1: The University of Electro-Communications, Japan; 2: Kokusai Kogyo Co., Ltd., Japan</p> <hr/> <p>Zero-shot detection of buildings in mobile LiDAR using Language Vision Model J. M. Goo, Z. Zeng, J. Boehm Department of Civil, Environmental and Geomatic Engineering, University College London, United Kingdom</p> |

ACCURATE CALCULATION OF TREE STEM TRAITS IN FORESTS USING LOCALIZED MULTI-VIEW REGISTRATION

H. Kawasaki, S. Komoriya, H. Masuda
The University of Electro-Communications, Japan

Optimizing mining ventilation using 3D technologies

P. Trybala¹, S. Rigon¹, F. Remondino¹, A. Banasiewicz², A. Wróblewski², A. Macek², P. Kujawa², K. Romańczukiewicz², C. Redondo³
1: Bruno Kessler Foundation, Italy; 2: Wrocław University of Science and Technology, Poland; 3: Hovering Solutions, Spain

6:00pm
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7:00pm

Gala: Gala

Date: Friday, 14/June/2024

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| 8:15am - 9:00am | Keynote - Zan Gojic |
| 9:00am - 10:00am | D4M1 - WG3: 3D scene reconstruction for modeling & mapping Chair: Franz Rottensteiner Instant 3D Gaussian Splatting with Microsoft HoloLens 2 M. Jäger , T. Kapler, M. Feßenbecker, F. Birkelbach, M. Hillemann, B. Jutzi Institute of Photogrammetry and Remote Sensing (IPF), Karlsruhe Institute of Technology (KIT), Germany Using passive multi-modal sensor data for thermal simulation of urban surfaces D. Bulatov ¹ , D. Frommholz ² , B. Kottler ¹ , K. Qiu ¹ , E. Strauß ¹ 1: Fraunhofer IOSB Ettlingen, Germany; 2: DLR Institute of Optical Sensor System, Berlin, Germany Depth Supervised Neural Surface Reconstruction from Airborne Imagery V. Hackstein ¹ , P. Fauth-Mayer ¹ , M. Rothermel ¹ , N. Haala ² 1: nFrames ESRI, Germany; 2: Institute for Photogrammetry and Geoinformatics, University of Stuttgart, Germany Unit-level LoD2 building reconstruction from satellite derived digital surface model and orthophoto S. Gui ¹ , P. Schuegraf ² , K. Bittner ² , R. Qin ¹ 1: The Ohio State University, United States of America; 2: Remote Sensing Technology Institute, German Aerospace Center (DLR), Weßling, Germany |
| 10:00am - 10:30am | D4 - Coffee - Morning |
| 10:30am - 11:30am | D4M2 - WG9: Vision Metrology Chair: Michael Weinmann Chair: Markus Ulrich Uncertainty-aware Cross-Entropy for Semantic Segmentation S. Landgraf , M. Hillemann, K. Wursthorn, M. Ulrich Karlsruhe Institute of Technology (KIT), Germany Uncertainty Quantification With Deep Ensembles For 6D Object Pose Estimation K. Wursthorn , M. Hillemann, M. Ulrich Karlsruhe Institute of Technology (KIT), Germany Potential of Novel View Synthesis with Neural Radiance Fields for Industrial Robot Applications M. Hillemann ¹ , M. Heiken ² , M. Mehtretter ² , R. Langendörfer ¹ , A. Schenk ¹ , M. Weinmann ¹ , S. Hinz ¹ , C. Heipke ² , M. Ulrich ¹ 1: Institute of Photogrammetry and Remote Sensing, Karlsruhe Institute of Technology, Germany; 2: Institute of Photogrammetry and GeoInformation, Leibniz Universität Hannover, Germany The Potential of Neural Radiance Fields and 3D Gaussian Splatting for 3D Reconstruction from Aerial Imagery D. Haitz ^{1,2} , M. Hermann ^{1,3} , A. S. Roth ¹ , M. Weinmann ² , M. Weinmann ¹ 1: Karlsruhe Institute of Technology, Germany; 2: Delft University of Technology, Netherlands; 3: Fraunhofer IOSB, Germany |
| 11:30am - 12:30pm | D4M3 - ICWGIIIa: Autonomous Sensing Systems and their Applications Chair: Eija Honkavaara Chair: Taejung Kim UAS Visual Navigation in Large and Unseen Environments via a Meta Agent Y. Han ¹ , C. Toth ² , A. Yilmaz ³ 1: the ohio state university, United States of America; 2: the ohio state university, United States of America; 3: the ohio state university, United States of America Specialist approach to driving scene perception in poor visibility conditions K. Khoshelham , S. Anbumozhi, Z. Huang University of Melbourne, Australia Autonomous robotic drone system for mapping forest interiors V. Karjalainen , N. Koivumäki, T. Hakala, A. George, J. Muhojoki, E. Hyypä, J. Suomalainen, E. Honkavaara Finnish Geospatial Research Institute, Finland ESTIMATION OF 3D POSES AND SHAPES OF ANIMALS FROM DRONE IMAGERY FOR COMPREHENSIVE TERRESTRIAL WILDLIFE MONITORING V. Shukla ^{1,2} , F. Remondino ¹ , D. Tuia ³ , B. Risse ² 1: Bruno Kessler Institute, Italy; 2: University of Muenster, Germany; 3: EPFL, Switzerland |
| 12:30pm - 1:45pm | Day 4 - Lunch |
| 1:45pm - 2:45pm | D4A1 - [WG1 + WG2]: Image orientation and point cloud processing Precise Relative Geometric Correction for Multi-Sensor Satellite Images S. Ban , T. Kim Dept. of Geoinformatic engineering, Inha University, Republic of Korea (South Korea) Mobile Phone Based Indoor Mapping C. Strecha , M. Rehak, D. Cucci Pix4D SA, Switzerland COMPARATIVE ASSESSMENT OF ARCHAEOLOGICAL SCENE RECONSTRUCTION USING IPHONE's LiDAR B. P. Bhatta ¹ , A. Shah ¹ , M. K. Chaulagain ¹ , A. Dhungana ¹ , L. Mandal ¹ , P. Koirala ¹ , S. Thapa ² , U. S. Panday ¹ 1: Kathmandu University, Nepal; 2: Lund University, Sweden Key-Region-Based UAV Visual Navigation M. Karnes , J. Riffel, A. Yilmaz |

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| | The Ohio State University |
| 2:45pm - 3:45pm | <p>D4A2 - ICWGIIIb: Digital Construction: Reality Capture, Automated Inspection, and Integration to BIM Chair: Kourosh Khoshelham</p> <p>Assisting Visual Inspection of Bridge Components: Geometric Analysis of Cracks Using Semantic Segmentation and RGBD Camera Y. Lin, J.-Y. Rau, C.-H. Lin, Y.-C. Chen National Chung Kung University, Taiwan</p> <hr/> <p>SLAM for indoor mapping of wide area construction environments V. Röss, W. Zhang, D. Skuddis, N. Haala, U. Soergel Institute for Photogrammetry - University of Stuttgart, Germany</p> <hr/> <p>Image-based Deep Learning for the time-dependent prediction of fresh concrete properties M. Meyer¹, A. Langer¹, M. Mehitretter¹, D. Beyer², M. Coenen², T. Schack², M. Haist², C. Heipke¹ 1: Institute of Photogrammetry and GeoInformation, Leibniz University Hannover, Germany; 2: Institute of Building Materials Science, Leibniz University Hannover, Germany</p> <hr/> <p>A NOVEL APPROACH TO IMAGE RETRIEVAL FOR VISION-BASED POSITIONING UTILIZING GRAPH TOPOLOGY A. Elashry¹, C. Toth² 1: Elsewedy university of technology, Egypt; 2: The Ohio State University, US</p> |
| 3:45pm - 4:15pm | <p>Closing Session Chair: Alper Yilmaz Chair: Jan Dirk Wegner</p> |