



10th International Workshop on Laser Scanning (LS 2017)

Preliminary Schedule

Sept 19-20, 2017, during ISPRS Geospatial Week 2017
Wuhan, Hubei, China

Website: <http://www2.ipf.kit.edu/laserscanning2017/>

Laser Scanning 2017 (LS 2017) is the tenth event of a series of biannual ISPRS workshops focusing on terrestrial, mobile, airborne and spaceborne laser scanning, thereby continuing a tradition that started back in 1999. The workshop brings together experts on acquiring, processing and applying point cloud data obtained by laser scanners and other active imaging systems in both indoor and outdoor environments. Topics include sensor calibration, data acquisition, and data processing steps such as registration, segmentation and classification, feature extraction and object detection. Also signal aspects such as intensity data and full waveform data and topics involving kinetic sensors and moving objects are covered.

The workshop is organized in conjunction with other workshops during the ISPRS Geospatial Week 2017 in Wuhan, China. Laser Scanning is strongly rooted in the ISPRS society. Four different ISPRS working groups from two technical commissions have worked together in organizing this workshop: WG II/10, 3D Mapping for Environmental and Infrastructure Monitoring; WG II/3, Point Cloud Processing; WG II/4, 3D Scene Reconstruction and Analysis and WG III/6, Remote Sensing Data Fusion. Three further working groups have sponsored the workshop: WG III/1, Thematic Information Extraction; WG III/5, Information Extraction from LiDAR Intensity Data and III/6, Remote Sensing Data Fusion

45 full papers entered a double blind review process. Members of the scientific committee thoroughly read and commented on the papers, and authors received feedback from at least two and often three reviewers. Given the review results we were able to accept 21 papers for inclusion in the ISPRS Annals and 18 papers in the ISPRS Archives, while remaining contributions were either rejected or withdrawn. Selection in favor of ISPRS Annals was done based on the maturity of a manuscript as judged by both the reviewers and the organizing committee, but it should be noted that also the contributions that will appear in the ISPRS Archives contain some very interesting new ideas.

Finally, we wish to thank all authors for their contributions and all reviewers for their excellent job in evaluating the manuscripts. We look forward to the ISPRS Geospatial Week 2017, to the different oral and poster presentations in LS 2017, but also to the possibility to exchange ideas both within our workshop and with the presenters and visitors of the other workshops that together make the Geospatial Week.

Roderik Lindenbergh, Bisheng Yang, Jan Boehm, Martin Rutzinger, Wei Yao and Martin Weinmann

Organizing ISPRS Working Groups

ISPRS WG II/10, 3D Mapping for Environmental and Infrastructure Monitoring

ISPRS WG II/3, Point Cloud Processing

ISPRS WG II/4, 3D Scene Reconstruction and Analysis

Organizing Committee

Wuhan University, ISPRS WG II/10, WG II/3, WG II/4 and WG III/6



ISPRS WG III/6, Remote Sensing Data Fusion

Sponsoring ISPRS Working Groups

ISPRS WG III/1, Thematic Information Extraction

ISPRS WG III/5, Information Extraction from LiDAR Intensity Data

ISPRS WG III/6, Remote Sensing Data Fusion

Organizing Committee

Wuhan University, ISPRS WG II/10, WG II/3, WG II/4 and WG III/6



Committee

Organizing Committee:

Dr. Roderik Lindenbergh (ISPRS WG II/10, Chair), Delft University of Technology, The Netherlands

Prof. Dr. Bisheng Yang (ISPRS WG II/3, Co-chair), Wuhan University, China

Dr. Jan Boehm (ISPRS WG II/3, Co-chair), University College London, United Kingdom

Dr. Martin Rutzinger (ISPRS WG II/10, Co-chair), Austrian Academy of Sciences, Austria

Dr. Wei Yao (ISPRS WG III/6, Co-chair), Munich University of Applied Sciences, Germany

Dr. Martin Weinmann (ISPRS WG II/4, Secretary), Karlsruhe Institute of Technology, Germany

Scientific Committee:

David Belton (Curtin University, Australia)

Robert Blaskow (Technische Universität Dresden, Germany)

Rosmarie Blomley (Karlsruhe Institute of Technology, Germany)

Magnus Bremer (University of Innsbruck, Austria)

Andreas Cziferszky (University of Innsbruck, Austria)

Jean-Emmanuel Deschaud (MINES ParisTech, France)

Anette Eltner (Technische Universität Dresden, Germany)

Higinio Gonzalez-Jorge (University of Vigo, Spain)

Ben Gorte (Delft University of Technology, The Netherlands)

Bo Guo (Shenzhen University, China)

Marcus Hebel (Fraunhofer IOSB, Germany)

Monica Herrero (Delft University of Technology, The Netherlands)

Bernhard Höfle (University of Heidelberg, Germany)

Ludwig Hoegner (Technische Universität München, Germany)

Hai Huang (Universität der Bundeswehr München, Germany)

Boris Jutzi (Karlsruhe Institute of Technology, Germany)

Sanna Kaasalainen (Finnish Geodetic Institute, Finland)

Kourosh Khoshelham (University of Melbourne, Australia)

Peter Krzystek (Munich University of Applied Sciences, Germany)

Xinlian Liang (Finnish Geodetic Institute, Finland)

Xiangguo Lin (Chinese Academy of Surveying and Mapping, China)

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Paula Litkey (Finnish Geodetic Institute, Finland)

Tamas Lovas (Budapest University of Technology and Economics, Hungary)

Gottfried Mandlbauer (University of Stuttgart, Germany)

Leena Matikainen (Finnish Geodetic Institute, Finland)

Andreas Mayr (University of Innsbruck, Austria)

Abdul A. M. Nurunnabi (Curtin University, Australia)

Michael Olsen (Oregon State University, USA)

Sander Oude Elberink (University of Twente, The Netherlands)

Chris Parrish (Oregon State University, USA)

Francesco Pirotti (University of Padova, Italy)

Przemyslaw Polewski (Munich University of Applied Sciences, Germany)

Cristiano Premebida (University of Coimbra, Portugal)

Pasi Raunonen (Tampere University of Technology, Finland)

Camillo Ressel (TU Vienna, Austria)

Belen Riveiro (University of Vigo, Spain)

José Alberto Rodrigues (Instituto Superior de Engenharia de Lisboa, Portugal)

Andreas Roncat (TU Vienna, Austria)

Franz Rottensteiner (Leibniz Universität Hannover, Germany)

Marco Scaioni (Tongji University, China)

Konrad Schindler (ETH Zürich, Switzerland)

Danilo Schneider (Technische Universität Dresden, Germany)

Ivan Tomljenovic (University of Zagreb, Croatia)

Linh Truong-Hong (TU Vienna, Austria)

Bruno Vallet (IGN, France)

Jinhu Wang (Delft University of Technology, The Netherlands)

Michael Weinmann (University of Bonn, Germany)

Volker Wichmann (alpS GmbH, Austria)

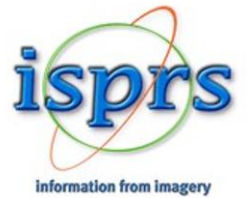
Man Sing Wong (Hong Kong Polytechnic University, Hong Kong)

Jianwei Wu (Wuhan University, China)

Sven Wursthorn (Karlsruhe Institute of Technology, Germany)

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Wen Xiao (Newcastle University, UK)

Yusheng Xu (Technische Universität München, Germany)

Wuming Zhang (Beijing Normal University, China)

Dong Zhen (Wuhan University, China)

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Session Overview

| Date | Time | Contents | | Chair/Co-chair | Room |
|---|-------------|--|--|------------------------|--------------|
| Tuesday 19 th , Sept. AM | 09:00-10:30 | Keynote Speech | High Definition Mapping, Localization and Self-Driving Cars at Baidu Shiyu Song, Baidu, China | Dr. Roderik Lindenberg | Tianmen Hall |
| | 10:30-11:00 | Tea Break | | | |
| | 11:00-12:30 | LS-01: Acquisition and Registration | | Dr. Wei Yao | Tianmen Hall |
| Lunch | | | | | |
| Tuesday 19 th , Sept. PM | 14:00-15:30 | LS-02: Classification | | Dr. Jan Böhm | Tianmen Hall |
| | 15:30-16:00 | Tea Break | | | |
| | 16:00-17:30 | LS-03: Vegetation applications | | Prof. Bisheng Yang | Tianmen Hall |
| Dinner & Rest | | | | | |
| Wednesday 20 th , Sept. AM | 09:00-10:30 | Keynote Speech | Deep learning for the extraction of DTMs from point clouds generated by dense matching George Vosselman, ITC, University of Twente, Netherlands | Prof. Bisheng Yang | Tianmen Hall |
| | 10:30-11:00 | Tea Break | | | |
| | 11:00-12:30 | LS-04: Segmentation and Identification | | Dr. Martin Rutzinger | Tianmen Hall |
| Lunch | | | | | |
| Wednesday 20 th , Sept. PM | 14:00-15:30 | LS-05: Moving objects and moving rovers | | Dr. Roderik Lindenberg | Tianmen Hall |
| | 15:30-16:00 | Tea Break | | | |
| | 16:00-17:30 | LS-06: Intensity and waveform analysis | | Dr. Martin Weinmann | Tianmen Hall |
| | 14:00-17:30 | Joint Poster Session | | | First Floor |

LS-01: Acquisition and Registration

Chair: Dr. Wei Yao

Co-chair:

Room: Tianmen Hall

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| 11:00-12:30, Tuesday, 19 th , Sept. | <p>Title: AUTOMATED COARSE REGISTRATION OF POINT CLOUDS IN 3D URBAN SCENES USING VOXEL BASED PLANE CONSTRAINT</p> <p>Authors: Yusheng Xu (Technische Universitaet Muenchen, Germany), Richard Boerner, Wei Yao, Ludwig Hoegner and Uwe Stilla</p> |
| | <p>Title: A COMPARATIVE STUDY OF AUTOMATIC PLANE BASED REGISTRATION FOR MLS SPARSE POINT CLOUDS WITH DIFFERENT PLANE DETECTION METHODS</p> <p>Authors: Hoang Long Nguyen (Department of Spatial Sciences, Curtin University, Australia), David Belton and Petra Helmholz</p> |
| | <p>Title: Benchmarking continuous-time SLAM using a predefined trajectory provided by a robotic arm</p> <p>Authors: Betram Koch (University of Würzburg, Germany), Robin Leblebici, Angel Martell, Sven Jörissen, Klaus Schilling and Andreas Nüchter</p> |
| | <p>Title: A COMPARISON OF SIMULATED ANNEALING, GENETIC ALGORITHM AND PARTICLE SWARM OPTIMIZATION IN OPTIMAL FIRST-ORDER DESIGN OF INDOOR TLS NETWORKS</p> <p>Authors: Fengman Jia (University of Calgary, Canada) and Derek Lichti</p> |

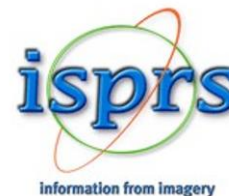
LS-02: Classification

Chair: Dr. Jan Böhm

Co-chair:

Room: Tianmen Hall

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| 14:00-15:30, Tuesday, 19 th , Sept. | <p>Title: A TWO-STEP CLASSIFICATION APPROACH TO DISTINGUISHING SIMILAR OBJECTS IN MOBILE LIDAR POINT CLOUDS</p> <p>Authors: Hanxian He (The University of Melbourne, Australia), Kourosh Khoshelham and Clive Fraser</p> |
| | <p>Title: Airborne LiDAR Points Classification Based on Tensor Sparse Representation</p> <p>Authors: Nan Li (Vienna University of Technology (TU Wien), Austria; Tongji University, China), Chun Liu and Norbert Pfeifer</p> |
| | <p>Title: AIRBORNE LIDAR POWER LINE CLASSIFICATION BASED ON SPATIAL TOPOLOGICAL STRUCTURE CHARACTERISTICS</p> <p>Authors: Yanjun Wang (Hunan Univ. of Science and Technology, China; Univ. of Hawai'i at Mānoa, USA), Qi Chen, Kai Li, Dunyong Zheng and Jun Fang</p> |
| | <p>Title: USING MULTI-SCALE FEATURES FOR THE 3D SEMANTIC LABELING OF AIRBORNE LASER SCANNING DATA</p> <p>Authors: Rosmarie Blomley (Karlsruhe Institute of Technology (KIT), Germany) and Martin Weinmann</p> |



| LS-03: Vegetation applications | |
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| Chair: Prof. Bisheng Yang | |
| Co-chair: Room: Tianmen Hall | |
| 16:00-17:30, Tuesday, 19 th , Sept. | <p>Title: WHEAT EAR DETECTION IN PLOTS BY SEGMENTING MOBILE LASER SCANNER DATA</p> <p>Authors: Kaaviya Velumani (University of Twente, Netherlands), Sander Oude Elberink, Michael Yang and Frederic Baret</p> |
| | <p>Title: FEASIBILITY OF MACHINE LEARNING METHODS FOR SEPARATING WOOD AND LEAF POINTS FROM TERRESTRIAL LASER SCANNING DATA</p> <p>Authors: Di Wang (Vienna University of Technology (TU Wien), Austria), Markus Hollaus and Norbert Pfeifer</p> |
| | <p>Title: DETECTION OF SINGLE TREE STEMS IN FORESTED AREAS FROM HIGH DENSITY ALS POINT CLOUDS USING 3D SHAPE DESCRIPTORS</p> <p>Authors: Nina Amiri (Munich University of Applied Sciences, Germany), Przemyslaw Polewski, Wei Yao, Peter Krzystek and Andrew Skidmore</p> |
| | <p>Title: SIMULATING VARIOUS TERRESTRIAL AND UAV LIDAR SCANNING CONFIGURATIONS FOR UNDERSTORY FOREST STRUCTURE MODELLING</p> <p>Authors: Martin Hämmerle (Heidelberg University, Germany), Niko Lukač, Kuei-Chia Chen, Zsófia Koma, Chi-Kuei Wang, Katharina Anders and Bernhard Höfle</p> |

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Poster Session and Flash Presentations

Date: Wednesday, 20th, Sep, 14:00-17:30 PM

Room: First Floor

Title: 3D SCANNING OF LIVE PIGS SYSTEM AND ITS APPLICATION IN BODY MEASUREMENTS

Authors: Guo Hao(China Agricultural University, China) and Zhu Dehai

Title: MEASUREMENT ERROR WITH DIFFERENT COMPUTER VISION TECHNIQUES

Authors: Octavio Icasio-Hernández(Centro Nacional de Metrología and Instituto Politécnico Nacional (CICATA), Mexico) , Yajaira Ilse Curiel Razo, Cesar-Cruz Almaraz-Cabral , Sergio Raúl Rojas-Ramírez and José-Joel González-Barbosa

Title: MODELLING MEAN ALBEDO OF INDIVIDUAL ROOFS IN COMPLEX URBAN AREAS USING SATELLITE IMAGES AND AIRBORNE LASER SCANNING POINT CLOUDS

Authors: Bahareh Kalantar(Universiti Putra Malaysia, Malasia), Shattri Mansor, Zailani Khuzaimah, Maher Ibrahim Sameen and Biswajeet Pradhan

Title: AUTOMATIC PARKING OF SELF-DRIVING CAR BASED ON 3-D LIDAR

Authors: Bijun Li(Wuhan University, China), Guo Yuan and Wei Yang

Title: SEMANTIC LABELLING OF ROAD FURNITURE IN MOBILE LASER SCANNING DATA

Authors: Fashuai Li(ITC-University of Twente, The Netherlands), Sander Oude Elberink and George Vosselman

Title: COLLISION VISUALIZATION OF A LASER-SCANNED POINT CLOUD OF STREETS AND A FESTIVAL FLOAT MODEL USED FOR THE REVIVAL OF A TRADITIONAL PROCESSION ROUTE

Authors: Weite Li(Ritsumeikan University, Japan), Kenya Shigeta, Kyoko Hasegawa, Liang Li, Keiji Yano and Satoshi Tanaka

Title: LAND COVERS CLASSIFICATION BASED ON RANDOM FOREST METHOD USING FEATURES FROM FULL-WAVEFORM LIDAR DATA

Authors: Lian Ma(Academy of Opto-electronics, Chinese Academy of Sciences, China), Mei Zhou and Chuanrong Li

Title: 3D-EDGE DETECTION FOR ALS POINT CLOUD AND ITS APPLICATIONS

Authors: Huan Ni(Chinese Academy of Surveying and Mapping, China), Xiangguo Lin and Jixian Zhang

Title: A COMPARISON OF TREE SEGMENTATION METHODS USING VERY HIGH DENSITY AIRBORNE LASER SCANNER DATA

Authors: Francesco Pirotti(CIRGEO-Interdepartmental Research Center for Geomatics, University of Padova, Italy) , Milan Kobal and Jean Romain Roussel

Title: CSF BASED NON-GROUND POINTS EXTRACTION FROM LIDAR DATA

Authors: Aojie Shen(Beijing Normal University, China), Wuming Zhang and Huiling Shi

Title: MINI-UAV LIDAR FOR POWER LINE INSPECTION

Authors: Geer Teng(Academy of Opto-Electronics,CAS, China), Mei Zhou, Chuanrong Li, Haohao Wu, Wei Li, Fanrong Meng, Chuncheng Zhou and Lian Ma

Title: POINT CLOUD MODELLING BASED ON THE TUNNEL AXIS AND BLOCK ESTIMATION FOR MONITORING THE BADALING TUNNEL, CHINA

Authors: Jin Wang(Beijing University of Technology, China), Hebin Zheng, Hai Huang and Guowei Ma

Title: POINT CLOUD SEGMENTATION OF GULLY BASED ON CHARACTERISTIC DIFFERENCE USING AIRBORNE LIDAR DATA

Authors: Ying Xu(College of Resources and Environment, Henan University of Economics and Law, China), Dongjie Yue and Peipei He

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Title: CARBON SEQUESTRATION ESTIMATION OF STREET TREES BASED ON POINT CLOUD FROM VEHICLE-BORNE LASER SCANNING SYSTEM

Authors: Yingyi Zhao(School of Remote Sensing and Information Engineering, Wuhan University, China) and Qingwu Hu

Title: CLASSIFICATION OF MOBILE LASER SCANNING POINT CLOUDS FROM HEIGHT FEATURES

Authors: Mingxue Zheng(Wuhan University, China and Delft University of Technology, The Netherlands), Mathias Lemmens and Peter Van Oosterom

LS-04: Segmentation and Identification

Chair: Dr. Martin Rutzinger

Co-chair:

Room: Tianmen Hall

11:00-12:30,
Wednesday,
20th, Sept.

Title: PROJECTOR-BASED AUGMENTED REALITY FOR QUALITY INSPECTION OF SCANNED OBJECTS

Authors: Jens Kern (Institute of Photogrammetry and Remote Sensing (IPF), KIT, Germany), Martin Weinmann and Sven Wursthorn

Title: FAST EDGE DETECTION AND SEGMENTATION OF TERRESTRIAL LASER SCANS THROUGH NORMAL VARIATION ANALYSIS

Authors: Erzhuo Che (Oregon State University, USA) and Michael Olsen

Title: Vehicle recognition in aerial lidar point cloud based on dynamic time warping

Authors: Tonggang Zhang (Southwest Jiaotong University, China), George Vosselman and Sander Oude Elberink

Title: WATER SURFACE RECONSTRUCTION IN AIRBORNE LASER BATHYMETRY FROM REDUNDANT BED OBSERVATIONS

Authors: Gottfried Mandlbürger (Institute for Photogrammetry, University of Stuttgart, Germany), Norbert Pfeifer and Uwe Soergel

LS-05: Moving objects and moving rovers

Chair: Dr. Roderik Lindenbergh

Co-chair:

Room: Tianmen Hall

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| 14:00-15:30 Wednesday, 20 th , Sept. | <p>Title: DETECTION OF PERSONS IN MLS POINT CLOUDS USING IMPLICIT SHAPE MODELS</p> <p>Authors: Björn Borgmann(Fraunhofer Institute of Optronics, System Technologies and Image Exploitation IOSB, Germany), Marcus Hebel, Michael Arens and Uwe Stilla</p> |
| | <p>Title: Point-cloud compression for vehicle-based mobile mapping systems using portable network graphics</p> <p>Authors: Keisuke Kohira (The University of Electro-Communications, Japan) and Hiroshi Masuda</p> |
| | <p>Title: Change analysis of laser scans of laboratory rock slopes subject to wave attack testing</p> <p>Authors: Yueqian Shen (School of Earth Sciences and Engineering, HOHAI University, China), Roderik Lindenbergh, Bas Hofland and Roy Kramer</p> |
| | <p>Title: OCCUPANCY MODELLING FOR MOVING OBJECT DETECTION FROM LIDAR POINT CLOUDS: A COMPARATIVE STUDY</p> <p>Authors: Wen Xiao (Newcastle University, United Kingdom), Bruno Vallet, Yong Xiao, Jon Mills and Nicolas Paparoditis</p> |

LS-06: Intensity and waveform analysis

Chair: Dr. Martin Weinmann

Co-chair:

Room: Tianmen Hall

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| 16:00-17:30 Wednesday, 20 th , Sept. | <p>Title: CLUSTERING OF MULTISPECTRAL AIRBORNE LASER SCANNING DATA USING GAUSSIAN DECOMPOSITION</p> <p>Authors: Salem Morsy(Ryerson University, Canada), Ahmed Shaker and Ahmed El-Rabbany</p> |
| | <p>Title: A CURVATURE BASED ADAPTIVE NEIGHBORHOOD FOR INDIVIDUAL POINT CLOUD CLASSIFICATION</p> <p>Authors: Elong He(Faculty of Information Engineering, China University of Geosciences (Wuhan) ,China), Qi Chen, Hongping Wang and Xiuguo Liu</p> |
| | <p>Title: Surface Fitting Filtering of LiDAR Point Cloud with Waveform Information</p> <p>Authors: Shuai Xing (Zhengzhou Institute of Surveying and Mapping , China), Pengcheng Li, Qing Xu, Dandi Wang and Peng Li</p> |
| | <p>Title: Assessment of Bottom-of-Atmosphere Reflectance in Lidar data as Reference for Hyperspectral Imagery</p> <p>Authors: Andreas Roncat (Vienna University of Technology (TU Wien), Austria), Norbert Pfeifer and Christian Briese</p> |

