

2017 Baltic Geodetic Congress (BGC Geomatics 2017)

**Gdansk, Poland
22-25 June 2017**



**IEEE Catalog Number: CFP17F89-POD
ISBN: 978-1-5090-6041-2**

**Copyright © 2017 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP17F89-POD
ISBN (Print-On-Demand):	978-1-5090-6041-2
ISBN (Online):	978-1-5090-6040-5

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2017 Baltic Geodetic Congress

BGC Geomatics 2017

Table of Contents

Conference Committees.....	xi
Sponsors and Partners.....	xiii

Technical Papers

4D Reconstruction and Visualisation of Krakow Fortress	1
<i>Beata Hejmanowska, Ewa Glowienka, Krystyna Michalowska, Sławomir Mikrut, Piotr Kramarczyk, Piotr Opalinski, and Agnieszka Strus</i>	
A Comparison of Housing Prices Calculated Through Floor Premium and Housing Prices Calculated Through Valuation Reports	6
<i>Biról Alas</i>	
A Novel Approach of Laser Scanning Point Cloud Quality Assessment Using Wavelet Analysis	11
<i>Anna Fryskowska</i>	
A Novel Method of Chromatic Aberration Detection and Correction Using Wavelet Analysis	18
<i>Anna Fryskowska, Michal Kedzierski, Michalina Wojtkowska, and Aleksandra Grochala</i>	
Accuracy Study of Close Range 3D Object Reconstruction Based on Point Clouds	25
<i>Grzegorz Gabara and Piotr Sawicki</i>	
Accuracy Tests of Vertical Component of RTK GNSS Measurements Corrected by a Laser System	30
<i>Toomas Orason, Tarmo Kall, Martin Sirk, and Aive Liibus</i>	
Airborne Laser Scanning Point Cloud Update by Used of the Terrestrial Laser Scanning and the Low-Level Aerial Photogrammetry	34
<i>Adam Ingot and Paweł Tysiąc</i>	
An Analysis of the Influence of Planning Conditions on Property Value	39
<i>Ryszard Cymerman and Lech Kotlewski</i>	
An Analysis of the Performance and Coordinates Time Series of CORS Network LitPOS	45
<i>Rimvydas Baniulis, Karolis Galinauskas, Leonardas Marozas, Eimuntas Paršeliūnas, Marius Petniūnas, and Vytautas Puškorius</i>	

Analysis of Factors Influencing Private Land Market in Lithuania	49
<i>Audrius Aleknavičius, Marius Aleknavičius, and Giedrius Balevičius</i>	
Analysis of Geodetical Measurements' Accuracy for Forest Block Network in Tytuvėnai State Forest Enterprise	54
<i>Ina Bikuviene, Ina Zivatkauskiene, Aurelijus Zivatkauskas, Marek Ogryzek, and Krystyna Kurowska</i>	
Analysis of Reconnaissance Imagery Acquired in Different Spectral Ranges of the Electromagnetic Spectrum	59
<i>Michał Kedzierski, Damian Wierzbicki, Paulina Delis, and Marcin Walkowiak</i>	
Analysis of the Impact of Galileo Observations on the Tropospheric Delays Estimation	65
<i>Zofia Bałdysz, Marcin Szolucha, Grzegorz Nykiel, and Mariusz Figurski</i>	
Analysis of the Use of GNSS Systems in Road Construction	72
<i>Slavomír Labant, Marcela Gergeľová, Gabriel Weiss, and Juraj Gašinec</i>	
Analysis of Variability of the Motorway Impact on Agricultural Land as an Example A4 Motorway Section	77
<i>Stanisław Bacior and Wojciech Przegon</i>	
Application of BN in Risk Diagnostics Arising from the Degree of Urban Regeneration Area Degradation	83
<i>Magdalena Apollo, Beata Grzyl, and Emilia Miszewska-Urbańska</i>	
Application of Robust Estimation Methods to Displacements Determination in Geodetic Control Network of Dam	89
<i>Marek Banaś</i>	
Application of The Fuzzy Set Theory to Determine The Partial Factor of Safety	95
<i>Ewa Daniszewska</i>	
Automation of Dot Maps Production Supported by BDOT10k Database	100
<i>Stanisław Szombara</i>	
Cartographic Visualization in The Real Estate Market Investigation with the Use of GIS Tools	105
<i>Patrycja Pochwatka, Urszula Litwin, Tomasz Teterycz, and Agnieszka Bitner</i>	
Combined Method of Surface Flow Measurement Using Terrestrial Laser Scanning and Synchronous Photogrammetry	110
<i>Artur Janowski, Jakub Szulwic, and Patryk Ziółkowski</i>	
Comparative Analysis of 3D Models Made with Various Technologies on the Example of Altar in the Wang Temple in Karpacz	116
<i>Michał Strach, Alicja Tama, and Paulina Lewińska</i>	
Comparing the Effectiveness of ANNs and SVMs in Forecasting the Impact of Traffic-Induced Vibrations on Building	121
<i>Anna Jakubczyk-Gałczyńska, Adam Kristowski, and Robert Jankowski</i>	

Comparison of Quality of Metric Photos Relative Orientation in Micmac and PhotoScan	126
<i>Krystian Pyka</i>	
Complex Monitoring of the Coastal Cliffs on the Example of Cliff in Jastrzebia Gora, Poland	132
<i>Rafał Ossowski and Paweł Tysiąc</i>	
Design of Geodetic Network Using Controlled Computer Simulation	138
<i>Paweł Postek and Wojciech Pachelski</i>	
Design of Slender Reinforced Concrete Columns of Annular Cross-Section According to the Nominal Curvature Method and the Exact Method	143
<i>Krzysztof Klempka and Marek Jędrzejczak</i>	
Detecting Cantilever Beam Vibration with Accelerometers and GNSS	148
<i>Leszek Malyszko, Jacek Paziewski, Rafał Sieradzki, Edyta Kowalska, and Andrzej Rutkiewicz</i>	
Determination of Elastic Constants in Brazilian Tests Using Digital Image Correlation	153
<i>Leszek Malyszko, Piotr Bilko, and Edyta Kowalska</i>	
Determination of Land Degradation for Sustainable Development of Municipal Territories	158
<i>Velta Parsova, Anda Jankava, and Irena Kukule</i>	
Diagnostic of Geometry Distortion of a Wooden Structure Based on a Point Cloud	163
<i>Joanna A. Pawłowicz, Piotr Bilko, Szymon Sawczyński, and Elżbieta Szafranko</i>	
Digital Photogrammetry in the Analysis of the Ventricles' Shape and Size	169
<i>Katarzyna Bobkowska, Agata Kaczyńska, Adam Kosiński, and Marek Przyborski</i>	
Digital Zenith Camera's Results and Its Use in DFHRS v.4.3 Software for Quasi-Geoid Determination	174
<i>Katerina Morozova, Janis Balodis, Reiner Jäger, Ansis Zarins, and Augusts Rubans</i>	
Emergency Management for Infrastructure and Transportation Systems in the US	179
<i>Kasim A. Korkmaz</i>	
Establishment of the Right of Electricity Transmission Easement Through Court Proceedings	184
<i>Paweł Wysocki, Malgorzata Buško, and Karolina Elżbieciak</i>	
Evaluation of Inventory Surveying of Façade Scaffolding Conducted During ORKWIZ Project	189
<i>Łukasz Borowski, Michał Pieńko, and Piotr Wielgos</i>	
Fragmentation of Hydrographic Big Data Into Subsets During Reduction Process	193
<i>Marta Włodarczyk-Sielicka and Andrzej Stateczny</i>	

Fuzzy Sets in the GIS Environment in the Location of Objects on the Surface of Water Bodies	199
<i>Adam Inglot, Krzysztof Pyrchla, and Jerzy Pyrchla</i>	
Geometry Design and Structural Analysis of Steel Single-Layer Geodesic Domes	205
<i>Robert Szmit</i>	
GIS Tools for Assessing Wine Tourism Potential in Slovak Republic	210
<i>Marcela Gergeľová, Slavomír Labant, Ladislav Mixtaj, and Erik Weiss</i>	
Hydrographic Survey Data Model for the Purpose of Inter-System Exchange	215
<i>Natalia Wawrzyniak and Grzegorz Zaniewicz</i>	
Identifying Real Transport Networks in Rural Areas on the Basis of Cadastral Data	221
<i>Jaroslav Janus and Piotr Bozek</i>	
Impact of Galileo Observations on the Position and Ambiguities Estimation of GNSS Reference Stations	225
<i>Grzegorz Nykiel and Mariusz Figurski</i>	
Integration of Thermal Digital 3D Model and a MASW (Multichannel Analysis of Surface Wave) as a Means of Improving Monitoring of Spoil Tip Stability	232
<i>Paulina Lewińska, Rafał Matuła, and Artur Dyczko</i>	
Leptokurtosis of Error Distribution and its Influence on Estimation Accuracy. The Case of Three Estimates Applied in Adjustment of Geodetic Measurements	237
<i>Robert Duchnowski and Patrycja Wyszowska</i>	
Load Tests of the Movable Footbridge Over the Port Canal in Ustka	242
<i>Mikołaj Miskiewicz and Lukasz Pyrzowski</i>	
MEMS Gyro in the Context of Inertial Positioning	247
<i>Jerzy Demkowicz</i>	
Methodology of an Assessment of Building Construction Variants with the Use of Expert Systems	252
<i>Elżbieta Szafranko</i>	
National Height System Testing in Baltic Countries Using GNSS Measurements	257
<i>Armands Celms, Ilona Reķe, Donatas Rekus, and Giedrius Balevičius</i>	
On the Quality Parameters of the Modern Gravity Survey of the Lithuanian Territory	263
<i>Romuald Obuchowski, Petras Petroškevičius, Eimuntas Paršeliūnas, Vytautas Puškorius, Dominykas Šlikas, Povilas Viskontas, and Evelina Zigmantienė</i>	
On Using Spatial Data Infrastructure Concept for Exchange of Navigational Information on Ships	267
<i>Witold Kazimierski</i>	

Online Geocoding Services: A Benchmarking Analysis to Some European Cities	273
<i>Gianfranco Di Pietro and Fabio Rinnone</i>	
Problems Using Foam Concrete Substructure Building Foundations in Irrigated Soils	282
<i>Robert Wójcik and Maria Tunkiewicz</i>	
Regional Ionosphere Modeling Based on Multi-GNSS Data and TPS Interpolation	287
<i>Paweł Wielgosz, Anna Krypiak-Gregorczyk, and Andrzej Borkowski</i>	
Remote Sensing Methods in the Study of the Impact of Long-Term Process of Sulphur Mining on Environmental Changes of the Carpathian Foreland	292
<i>Krystyna Michałowska, Ewa Głowienka, and Beata Hejmanowska</i>	
Safety Assessment of the Regional Warmia and Mazury Road Network Using Time-Series Analysis	297
<i>Joanna Żukowska and Anna Górską-Pawliczuk</i>	
Sensors in River Information Services of the Odra River in Poland: Current State and Planned Extension	301
<i>Andrzej Stateczny</i>	
Single Frequency RTK Positioning Using Schreiber's Differencing Scheme	307
<i>Dawid Kwaśniak, Sławomir Cellmer, and Krzysztof Nowel</i>	
Spatial Approach to Risk Premium Determination for Residential Market Classification	312
<i>Małgorzata Renigier-Biłozor, Maurizio d'Amato, and Andrzej Biłozor</i>	
Stability of Permanent EPN Stations Near the Baltic Sea Shoreline	317
<i>Stanisław Szombara and Kamil Maciuk</i>	
Structural Health Monitoring System for Suspension Footbridge	321
<i>Mikołaj Miskiewicz, Lukasz Pyrzowski, and Krzysztof Wilde</i>	
Study of the Flow Dynamics of Surface Water Masses in the Area of the Coastal Gulf of Gdansk	326
<i>Krzysztof Pyrchla, Jerzy Pyrchla, Lech Kasyk, Monika Kijewska, and Martyna Leyk-Wesołowska</i>	
Technical Condition of Buildings Managed by the Agricultural Property Agency - Diagnosis And Assessment	331
<i>Jacek Zabielski and Izabela Zabielska</i>	
Technology of Rapid and Ultrarapid Static GPS/GLONASS Surveying in Urban Environments	336
<i>Mieczysław Bakuła and Rafał Kaźmierczak</i>	
Technology Roadmapping for Multi-Functional Composite Platform Application in Space Vehicles	343
<i>Maxim Kireitseu</i>	
Testing of Geodetic Laser Instruments Under Conditions of Air Turbulence	349
<i>Janusz Kwiecień</i>	

The Analysis of Resource Use Plans Based on Selected Municipalities – Towards the Realisation of Good Governance Concept	356
<i>Marta Gross and Ada Wolny</i>	
The Cokriging Method in the Process of Developing Land Value Maps	364
<i>Radosław Cellmer and Sabina Żróbek</i>	
The Digital Image Correlation System Accuracy Direct Testing Using Strain Gauges	369
<i>Andrzej Rutkiewicz and Artur Jakobczak</i>	
The Influence of Elevation Data Generalization on the Accuracy of the RUSLE Model	374
<i>Piotr Bożek and Jarosław Janus</i>	
The Integration of Image and Nonimage Data to Obtain Underwater Situation Refinement	378
<i>Izabela Bodus-Olkowska and Janusz Uriasz</i>	
The Use of Multi-Criteria GIS Analysis in the Revitalisation of Space	384
<i>Marek Ogryzek and Krzysztof Rząsa</i>	
Timber Frame Houses with Different Insulation Materials - Seismic Analysis	389
<i>Marcin Szczepanski, Wojciech Migda, and Robert Jankowski</i>	
Towards Precise Visual Navigation and Direct Georeferencing for MAV Using ORB-SLAM2	394
<i>Paweł Burdziakowski</i>	
Use of a Model of Potential to Analyse Population Distribution Structure	399
<i>Bogdan Wolak</i>	
Use of Optical Method for Improvement of Soil Dynamic Tests in Torsional Shear Apparatus	404
<i>Marcin Bujko, Piotr E. Srokosz, and Ireneusz Dyka</i>	
Video Imagery Orientation Acquired Using a Low Cost Mobile Mapping System	409
<i>Paulina Deliś, Michalina Wojtkowska, Aleksandra Grochala, and Magda Zacharek</i>	
Zenith Tropospheric Delay Estimates Using Absolute and Relative Approaches to GNSS Data Processing – Preliminary Results	414
<i>Paweł Gołaszewski, Katarzyna Stepniak, and Paweł Wielgosz</i>	
Author Index	419