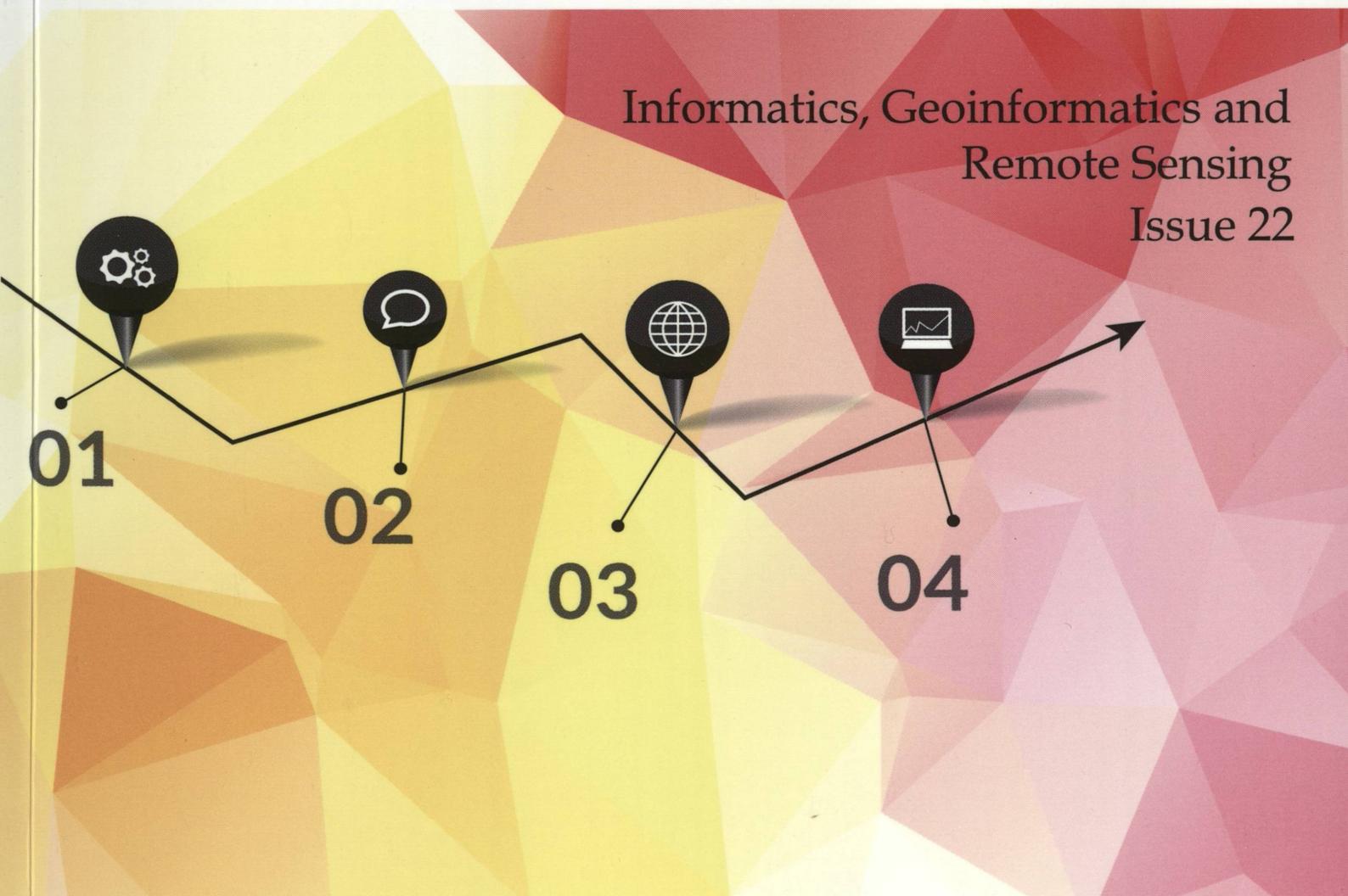


# 17<sup>th</sup> INTERNATIONAL MULTIDISCIPLINARY SCIENTIFIC GEOCONFERENCE **SGEM 2017**

CONFERENCE PROCEEDINGS  
**VOLUME 17**

Informatics, Geoinformatics and  
Remote Sensing  
Issue 22



GEODESY AND MINE SURVEYING

**17<sup>th</sup> INTERNATIONAL MULTIDISCIPLINARY  
SCIENTIFIC GEOCONFERENCE  
S G E M 2 0 1 7**

**CONFERENCE PROCEEDINGS  
VOLUME 17**



**INFORMATICS, GEOINFORMATICS AND REMOTE SENSING  
ISSUE 22**

**GEODESY AND MINE SURVEYING**

**29 June - 5 July, 2017  
Albena, Bulgaria**

## **DISCLAIMER**

This book contains abstracts and complete papers approved by the Conference Review Committee. Authors are responsible for the content and accuracy.

Opinions expressed may not necessarily reflect the position of the International Scientific Council of SGEM.

Information in the SGEM 2017 Conference Proceedings is subject to change without notice. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the express written permission of the International Scientific Council of SGEM.

**Copyright © SGEM2017**

**All Rights Reserved by the International Multidisciplinary Scientific GeoConferences SGEM  
Published by STEF92 Technology Ltd., 51 “Alexander Malinov” Blvd., 1712 Sofia, Bulgaria  
Total print: 5000**

**ISBN 978-619-7408-02-7**

**ISSN 1314-2704**

**DOI: 10.5593/sgem2017/22**

**INTERNATIONAL MULTIDISCIPLINARY SCIENTIFIC GEOCONFERENCE SGEM  
Secretariat Bureau**

**E-mail: [sgem@sgem.org](mailto:sgem@sgem.org) | URL: [www.sgem.org](http://www.sgem.org)**

## ORGANIZERS AND SCIENTIFIC PARTNERS

---

- THE CZECH ACADEMY OF SCIENCES
- LATVIAN ACADEMY OF SCIENCES
- POLISH ACADEMY OF SCIENCES
- RUSSIAN ACADEMY OF SCIENCES
- SERBIAN ACADEMY OF SCIENCES AND ARTS
- SLOVAK ACADEMY OF SCIENCES
- NATIONAL ACADEMY OF SCIENCES OF UKRAINE
- INSTITUTE OF WATER PROBLEM AND HYDROPOWER OF NAS KR
- NATIONAL ACADEMY OF SCIENCES OF ARMENIA
- SCIENCE COUNCIL OF JAPAN
- THE WORLD ACADEMY OF SCIENCES (TWAS)
- EUROPEAN ACADEMY OF SCIENCES, ARTS AND LETTERS
- ACADEMY OF SCIENCES OF MOLDOVA
- MONTENEGRIN ACADEMY OF SCIENCES AND ARTS
- CROATIAN ACADEMY OF SCIENCES AND ARTS, CROATIA
- GEORGIAN NATIONAL ACADEMY OF SCIENCES
- ACADEMY OF FINE ARTS AND DESIGN IN BRATISLAVA
- TURKISH ACADEMY OF SCIENCES
- NIZHNY NOVGOROD STATE UNIVERSITY OF ARCHITECTURE AND CIVIL ENGINEERING, RUSSIAN FEDERATION
- BULGARIAN ACADEMY OF SCIENCES
- BULGARIAN INDUSTRIAL ASSOCIATION
- BULGARIAN MINISTRY OF ENVIRONMENT AND WATER

## INTERNATIONAL SCIENTIFIC COMMITTEE

---

### **Informatics, Geoinformatics and Remote Sensing**

- PROF. ING. ALEŠ ČEPEK, CSC., CZECH REPUBLIC
- PROF. G. BARTHA, HUNGARY
- PROF. DR. DAMIR MEDAK, CROATIA
- PROF. PETER REINARTZ, GERMANY
- PROF. JAN KAZMIERCZAK, POLAND
- PROF. DR. JÓZSEF ÁDAM, HUNGARY
- PROF. RUI MIGUEL MARQUES MOURA, PORTUGAL

- PROF. DR. ING. KAREL PAVELKA, CZECH REPUBLIC
- PROF. DR. MARCEL MOJZES, SLOVAKIA
- PROF. VADIM ZHMUD, RUSSIA
- ASSOC. PROF. DR MILAN HOREMUZ, SWEDEN
- ASSOC. PROF. KRYSTYNA JANUSZKIEWICZ, POLAND
- DR. TIBERIU RUS, ROMANIA
- DR. MARKO KREVS, SLOVENIA

## CONFERENCE PROCEEDINGS CONTENTS

### SECTION GEODESY AND MINE SURVEYING

---

<b>1. 3D SCANNING OF THE HISTORICAL UNDERGROUND OF BENEDICTINE ABBEY IN TYNIEC (POLAND),</b> MSc Pelagia Gawronek, MSc Maria Makuch, Dr. Bartosz Mitka, MSc Piotr Bozek, MSc Przemyslaw Klapa, University of Agriculture in Krakow - University of Agriculture in Krakow, Poland .....	3
<b>2. A CADASTRAL MAP IN POLAND - THE PROPOSAL BASED ON ANALYSIS OF CADASTRAL MAPS IN SELECTED COUNTRIES,</b> D.Sc. Ph.D. Marcin Karabin, Robert Luczynski, Ph.D. Magdalena Karabin-Zych, Warsaw University of Technology, Poland.....	11
<b>3. A DESIGN SOLUTION OF THE MONITORING SYSTEM FOR DISPLACEMENTS AND DEFORMATIONS FOR AN EXPRESS ROAD,</b> C. Cosarca, A. Saracin, A. Savu, A.F.C. Negrila, P. Dumitru, Technical University of Civil Engineering of Bucharest, Romania.....	19
<b>4. A SURVEY OF SPATIAL POSITION FOR TRACK SECTION POVAZSKA TEPLA - ZILINA,</b> Kristina Hreusova, Martin Krupa, Andrea Wlochova, VSB- Technical University of Ostrava, Czech Republic .....	27
<b>5. ACCURACY ASSESSMENT OF ASTER AND SRTM DIGITAL ELEVATION MODELS: A CASE STUDY IN TURKEY,</b> H. Tugba Arli Il., Dr. R. Alpay Abbak, Ministry of Health, Turkey .....	35
<b>6. ACHIEVING BASIC AND CADASTRAL DATABASE RELATED TO A BLOCK IN THE BUILT SANDULESTI COMMUNE, CLUJ COUNTY, BY USING SOFTWARE G.I.S. AUTOCAD MAP,</b> Dr. Mircea Vasile Bondrea, Dr. Sanda Nas, PhD Paul Sestras, PhD Arsene Cornel, PhD Raluca Farcas, Technical University of Cluj-Napoca, Romania.....	43
<b>7. AERONAUTICAL SURVEYS OF OLSZTYN AIRFIELD AND SURROUNDINGS IN ORDER TO DEVELOP RNAV GNSS FLIGHT PROCEDURE,</b> Adam Ciecko, Grzegorz Grunwald, Tomasz Templin, Marek Dobek, University of Warmia and Mazury, Poland.....	51
<b>8. ALGORITHM OF GEOMAGNETIC ACTIVITY IERR/DERR-INDICES CALCULATION ANT ITS PROGRAMMING REALIZATION,</b> Andrei Vorobev, Olga Khristodulo, Oksana Efremova, Gulnara Vorobeva, Ufa State Aviation Technical University, Russia.....	59

<b>9. AN AGRO - FOREST BOUNDARY SHAPING IN THE AGRICULTURAL MANAGEMENT WORKS</b> , Taszakowski Jaroslaw, Glowacka Agnieszka, Bozek Piotr, Janus Jaroslaw, University of Agriculture in Krakow, Poland.....	67
<b>10. AN ARCHAEOLOGICAL - ARCHITECTURAL DOCUMENTATION BASED ON CLOSE RANGE PHOTOGRAHAMMETRY</b> , Dr Eng. Tadeusz Widerski, Msc. Karol Daliga, Gdansk University of Technology, Poland.....	75
<b>11. ANALYSIS OF HEIGHT CHANGES IN THE OLD HISTORIC QUARTER OF SANDOMIERZ IN THE ASPECT OF THE PROTECTION OF BUILDINGS AND UNDERGROUND INFRASTRUCTURE</b> , Rafal Gawalkiewicz, Anna Szafarczyk, AGH - University of Science and Technology, Poland .....	83
<b>12. ANALYSIS OF MATHEMATICAL MODELS FOR SOLVING PROBLEMS OF HIGH-ACCURACY SATELLITE GEODESY</b> , Baltiyeva A.A., Shamganova L.S., Kazakh National Technical University named after K.I.Satpayev, Kazakhstan ....	91
<b>13. ANALYSIS OF SATELLITE BASED GLOBAL GRAVITY FIELD MODELS ON GNSS/LEVELLING AND REFERENCE GRAVITY STATIONS WORLDWIDE</b> , Matej Varga, Ivana Vidic, Tomislav Basic, University of Zagreb, Croatia .....	99
<b>14. ANALYSIS OF THE ACCURACY OF THE POSITION OF THE DUAL-MODE SATELLITE RECEIVER ASHTECH GG24 USING THE SIMULATOR SPIRENT 6300M</b> , Bartlomiej Oszczak, Weronika Wisnioch, Janusz Cwiklak, Eliza Sitnik, Polish Airforce Academy, Poland.....	107
<b>15. APPLICATION OF TIME MEASUREMENTS FOR DETERMINATION OF GRAVITY POTENTIAL CHANGES</b> , Zofia Rzepecka, Joanna Kuczynska-Siehien Monika Birylo, University of Warmia and Mazury in Olsztyn, Poland .....	115
<b>16. ASPECTS REGARDING THE HORIZONTAL DISPLACEMENTS ANALYSIS AT CONCRETE DAMS</b> , Lecturer Tudor Salagean, Prof. Dumitru Onose, Prof. Teodor Rusu, PhD. Stud. Elemer-Emanuel Suba, PhD. Stud. Silvia Chiorean, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania .....	123
<b>17. BUILDING HEIGHT DETERMINATION AND TOPOGRAPHIC SURVEY COMPARISON BETWEEN THE TRADITIONAL METHOD AND THE MODERN USE OF REFLECTORLESS TOTAL STATION</b> , PhD Paul Sestrás, lecturer Mircea Vasile Bondrea, lecturer Sanda Nas, PhD Raluca Farcas, prof. Sorin Mihai Cimpeanu, Technical University of Cluj-Napoca, Romania .....	131
<b>18. CALIBRATION OF FIELD LENGTH BASELINES USING LEICA AT401 LASER TRACKER</b> , Ing. Filip Dvoracek, Czech Technical University in Prague, Czech Republic.....	139

---

<b>19. CALIBRATION OF THE LEVELLING RODS USING LASER INTERFEROEMTER</b> , Miljana Todorovic Drakul, Oleg Odalovic, Sanja Grekulovic, Faculty of Civil Engineering University of Belgrade, Serbia .....	147
<b>20. COREGISTRATION OF SAR IMAGES USING DUAL-POLARIMETRIC INFORMATION</b> , Dr. Inz. Stanislawa Porzycka-Strzelczyk, Dr. Inz. Jacek Strzelczyk, Dr. Inz. Anna Franczyk, Mgr Inz. Hubert Malik, AGH University of Science and Technology, Poland .....	155
<b>21. COMPARATIVE ANALYSIS OF ACTIVE GEODETIC NETWORKS IN POLAND</b> , Prof. Dr. Cezary Specht, Mariusz Specht, Paweł Dabrowski, Gdynia Maritime University, Poland .....	163
<b>22. BANCROFT ALGORITHM COMPARISON TO THE REFERENCE POINT INDICATOR METHOD</b> , Radosław Chrzan, Bartłomiej Oszczak, Janusz Cwiklak, Karol Olek, Polish Air Force Academy in Deblin, Poland .....	177
<b>23. CONTRIBUTIONS ON THE METHOD FOR INCLUDING THE GEODETIC POINTS IN THE TRIANGULATION NETWORKS</b> , Larisa Filip, Ioel Veres, Lucian Dragomir, University of Petrosani, Romania .....	187
<b>24. DECODING OF GPS DATA FOR SINGLE POINT POSITIONING COMPUTATION BY USING PYTHON PROGRAMMING LANGUAGE</b> , Bartłomiej Oszczak, Jędrzej Matuszak, Janusz Cwiklak, Polish Air Force Academy in Deblin, Poland .....	193
<b>25. DEFINING THE BOUNDARIES OF THE COMMERCIAL REAL ESTATE MARKET DEVELOPMENT</b> , Janusz Dabrowski, AGH University of Science and Technology, Poland .....	203
<b>26. DEFORMATION ANALYSIS OF THE CZERSKO POLSKIE ROLLER DAM STEEL DRUM USING CONVENTIONAL GEODETIC METHODS AND NEURAL NETWORKS</b> , Jacek Sztubecki PhD, Maria Mrowczynska Prof., Małgorzata Sztubecka PhD, University of Technology and Life Sciences in Bydgoszcz, Poland .....	211
<b>27. DETERMINATION OF A TRAJECTORY OF A MOVING CAR VEHICLE BASED ON THE GNSS SATELLITE TECHNOLOGY</b> , MSc Kamil Krasuski, Assoc. Prof. Dr Janusz Cwiklak, District Office of Ryki, Poland .....	219
<b>28. DETERMINATION OF THE PARAMETERS OF THE EFFECTS OF UNDERMINING IN SPECIFIC CONDITIONS OF BLOCK 7, MINE PLANT 1, AT THE LAZY SITE</b> , Tomas Patocka, Eva Jirankova, Martin Krupa, VSB-Technical University of Ostrava, Czech Republic .....	229

<b>29. DEVELOPMENT OF THE SECONDARY LANDSCAPE STRUCTURE IN THE CITIES OF MARTIN AND VRUTKY</b> , Jana Nozdrovicka, Martin Izsoff, Michaela Bencova, Dominika Kaisova, Constantine the Philosopher University in Nitra, Slovakia .....	235
<b>30. DIGITAL PHOTOGRAHAMTRY FOR CRACKS MONITORING</b> , Peter Pisca, Tomas Cesnek, University of Zilina, Slovakia .....	243
<b>31. DIRECTIONS FOR THE MODERNISATION OF THE LAND AND PROPERTY REGISTER SYSTEM IN POLAND</b> , Jadwiga Konieczna, Agnieszka Trystula, University of Warmia and Mazury in Olsztyn, Poland.....	249
<b>32. DISPLACEMENT MEASUREMENTS DURING LOAD TESTING OF RAILWAY ARCH BRIDGE</b> , Mikolaj Miskiewicz, Karolina Makowska, Gdansk University of Technology, Poland.....	257
<b>33. DOCUMENTATION OF THE MAIN TOWER OF THE MEDIEVAL CASTLE</b> , Tomas Kremen, Czech Technical University in Prague, Czech Republic ..	265
<b>34. ENSURING THE SAFETY OF UNDERGROUND OPERATIONS BY COMBINING METHODS FOR ESTIMATING THE DISPLACEMENTS PARAMETERS</b> , Assoc.Prof. Dmitriy Alexandrovich Ilyukhin, PhD Dilshod Khalmurodovich Rakhatkulov, Saint-Petersburg Mining University, Russia.....	273
<b>35. ESTIMATION OF AUTOLOCK MODE ACCURACY OF ROBOTIC TOTAL STATIONS WITH VARIOUS CONFIGURATIONS REFLECTORS</b> , Mikhail Vystrchil, Sergei Novozhenin, Saint-Petersburg Mining University, Russia..	281
<b>36. EVALUATION OF FORECASTS OF AREA DEFORMATION CAUSED BY MULTIDEPOSIT EXPLOITATION OF HARD COAL MADE BY THE BUDRYK-KNOTHE THEORY – CASE STUDY</b> , Justyna Orwat, Silesian University of Technology, Poland.....	289
<b>37. EVALUATION OF THE LAND CONSOLIDATION STUDIES DONE FOR VARIOUS PURPOSES IN TURKEY</b> , Assist. Prof. Dr. Kamil Karatas, Lecturer Musa Nehir Sozen, Aksaray University, Turkey .....	299
<b>38. EXAMINATION OF THE UNIFORMITY OF GNSS MEASUREMENTS BASED ON THE EXAMPLE OF POST-IMPLEMENTATION TECHNICAL INVENTORY OF BUILDINGS</b> , D.Sc. Ph.D. Marcin Karabin, Ph.D. Magdalena Karabin-Zych, Warsaw University of Technology, Poland .....	307
<b>39. FACTORS EFFECTING TO AREA AND ITS PRECISION IN CADASTRE OF REAL ESTATES</b> , Anna Seidlova, Jakub Chromcak, University of Zilina, Slovakia .....	315

---

<b>40. FEM ANALYSIS OF A CONVEYOR BELT ON THE DRIVING DRUM OF A PIPE CONVEYOR,</b> Gabriel Fedorko, Beata Jassova, Technical University of Kosice, Slovakia .....	321
<b>41. FUEL CONSUMPTION MONITORING IN MINING OPERATION FOR THE NEEDS OF ECONOMIC ANALYSIS OF TRANSPORT MEANS,</b> Hana Neradilova, Tomas Hodemarsky, Technical University of Kosice, Slovakia .....	329
<b>42. GEODETIC MEASUREMENTS OF MODERN MOVEMENTS OF THE EARTH SURFACE ON ALMATY GEODYNAMIC POLYGON,</b> Omirzhanova Zh., Kartbayeva K., Aimenov A., Jazbayev A., International Education Corporation, Kazakhstan .....	337
<b>43. GNSS NETWORK OPTIMIZATION BY THE METHOD OF THE MAXIMAL PRECISION INCREMENT,</b> Prof. Ing. Martin Stroner, Ph.D., Ing. Ondrej Michal, Assoc. Prof. Rudolf Urban, Ph.D., Czech Technical University in Prague, Czech Republic.....	347
<b>44. INDIRECT EFFECT OF THE HELMERT CONDENSATION REDUCTION OVER THE TERRITORY OF SERBIA,</b> Sanja Grekulovic, Oleg Odalovic, Miljana Todorovic Drakul, University of Belgrade, Serbia .....	355
<b>45. INFLUENCE OF THE REFRACTION ON TRIGONOMETRIC LEVELLING BETWEEN CLOSE POINTS,</b> Prof. Dr. Duro Barkovic, Sergej Baricevic, Assoc. Prof. Dr. Mladen Zrinjski, University of Zagreb, Croatia.....	361
<b>46. AN INTRODUCTION TO AN OPTIMAL REAL ESTATE ASSESSMENT,</b> Janusz Dabrowski, AGH University of Science and Technology, Krakow, Poland.....	369
<b>47. INVESTIGATION OF UNDERWATER OBJECTS ON THE NAREW RIVER BOTTOM BETWEEN MODLIN FORTRESS AND GRANARY,</b> Dariusz Popielarczyk, Marta Augustynowicz, University of Warmia and Mazury in Olsztyn, Poland .....	375
<b>48. INVESTIGATIONS OF THE EFFECTS OF TOPOGRAPHIC/BATHYMETRIC MASSES AND CRUSTAL PARAMETERS IN GRAVITY FIELD MODELING,</b> Matej Varga, Sime Skocic, Tomislav Basic, University of Zagreb, Croatia.....	383
<b>49. LONG-TERM MONITORING OF THE SLOVAK NATIONAL UPRISING BRIDGE,</b> Jan Erdelyi, Alojz Kopacik, Peter Kyrinovic, Milan Sokol, Milan Venglar, Slovak University of Technology Bratislava, Slovakia .....	389
<b>50. MANAGING OF MUNICIPAL HOUSING IN POLAND FROM PERSPECTIVE OF NEW PUBLIC MANAGEMENT,</b> Andrzej Muczynski, University of Warmia and Mazury in Olsztyn, Poland .....	397

<b>51. MEMS-INS/GPS DATA FUSION WITH ANFIS FOR THE PREDICTION OF THE NAVIGATION SOLUTION ERRORS DURING GPS OUTAGES</b> , Teodor Lucian Grigorie, Dragos George Sandu, Costinel Laurentiu Corcau, University Of Craiova, Romania .....	405
<b>52. MODERN LAND CONSOLIDATIONS IN POLAND – NEW IDEAS, INNOVATIONS AND TRENDS</b> , Agnieszka Trystula, Jadwiga Konieczna, University of Warmia and Mazury in Olsztyn, Poland .....	413
<b>53. ORTHODOX VALUATION METHOD APPLICATION ON THE EXAMPLE OF COWORKING</b> , Marek Walacik, University of Warmia and Mazury in Olsztyn, Poland .....	421
<b>54. PHOTOGRAMMETRIC AND TOTAL STATION'S MEASUREMENT OF COMPRESSED COLUMN'S MODEL</b> , Dr. eng. Tadeusz Widerski, Msc. eng. Karol Daliga, Gdansk University of Technology, Poland .....	427
<b>55. POSSIBILITIES OF SOME SPECIFIC SOLUTIONS IN THE TRANSFORMATION COORDINATE PROCEDURES FOR DEFORMATION INVESTIGATION OF THE GEOTECTONIC RECENT MOVEMENTS IN EAST SLOVAKIA</b> , Vladimir Sedlak, Jan Kanuk, Michal Gallay, Jaroslav Hofierka, Pavol Jozef Safarik University in Kosice, Slovakia .....	435
<b>56. POSSIBILITIES TO USE FUZZY LOGIC BASED METHODS IN GEODESY</b> , Prof. Dr. eng. Maricel Palamariu, Lect. Dr. eng. Alexandra Dreghici, Assoc. Prof. Dr. eng. habil. Ildiko Tulbere, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania .....	443
<b>57. POSSIBLE APPLICATIONS OF ELORAN SYSTEM FOR POSITIONING AND TIMING SYNCHRONIZATION IN UNDERGROUND MINING</b> , Alexandru Rusu-Casandra, University Politehnica of Bucharest, Romania .....	451
<b>58. PRE AND POST LAND CONSOLIDATION LAND FRAGMENTATION ASSESSMENT</b> , Muchova Zlatica, Leitmanova Maria, Michal Peter, Slovak Agriculture University in Nitra, Slovakia.....	461
<b>59. PROCEDURES FOR CHECKING THE GNSS EQUIPMENT</b> , Tiberiu Rus, Andrei-Serban Ilie, Constantin Moldoveanu, Valentin Danciu, Marin Plooreanu, Technical University of Civil Engineering Bucharest, Romania .....	469
<b>60. PROPOSAL POSITIONING SYSTEM BASED ON THE USE OF TWO IMS PLACED ON COMMON BASELINE AND OPTICAL ENCODER</b> , Ing. Pavol Kajanek, prof. Ing. Alojz Kopacik PhD., Slovak University of Technology, Slovakia	477
<b>61. PROTECTION OF MINERAL RESOURCES - PROTECTED MINERAL DEPOSIT TERRITORY IN LEGISLATIVE CONDITIONS OF THE SLOVAK REPUBLIC</b> , Diana Bobikova, Kamil Kysela, Technical University of Kosice, Slovakia.....	485

<b>62. QUALITY EVALUATION OF DIGITAL MAPS</b> , Jana Izvoltova, Jakub Chromcak, University of Zilina, Slovakia.....	499
<b>63. RATING OF THE AGRICULTURAL PRODUCTION AREA IN THE PROCESS OF LAND CONSOLIDATION WORKS</b> , Jacek Gniadek, Szewczyk Robert, Mariusz Zygmunt, Jaroslaw Janus, Bartosz Mitka, University of Agriculture in Krakow, Poland .....	507
<b>64. REAL TIME TEMPERATURE INFLUENCES ESTIMATION AND COMPENSATION IN A MINIATURE THREE-AXIAL GYRO DETECTION UNIT</b> , Teodor Lucian Grigorie, Constantin Irinel Gresita, Ileana Jenica Corcau, Liviu Dinca, University of Craiova, Romania .....	515
<b>65. REAL-TIME GEODETIC MEASUREMENTS OF ROTARY MACHINES</b> , Prof. Dr. Sergey G. Mogilny, Prof. Dr. Andrei A. Sholomitskii, Oleksiy V. Martynov, Prydniprovs'ka State Academy of Civil Engineering and Architecture, Ukraine .....	523
<b>66. REALIZATION OF GEODETIC NETWORK FOR MONITORING OF LANDSLIDE AREA NEAR TREBENICE</b> , Doc. Ing. Rudolf Urban, Ph.D., Prof. Ing. Martin Stroner, Ph.D., Ing. Jan Balek, The Czech Technical University in Prague, Czech Republic.....	531
<b>67. RECENT GEODETIC ACTIVITIES IN VRANCEA AREA FOR GEODYNAMIC INVESTIGATIONS – VRAGEO PROJECT</b> , Tiberiu Rus, Valentin Danciu, Constantin Moldoveanu, Alexandru Iliescu, Catalina Cristea, Technical University of Civil Engineering, Romania .....	539
<b>68. REGIONAL ANALYSIS OF RECENT GLOBAL GEOPOTENTIAL MODELS: A CASE STUDY IN TURKEY</b> , Selda Demir, Dr. Ramazan Alpay Abbak, Gaziosmanpasa University, Turkey.....	549
<b>69. RESEARCH ON VERTICAL DISPLACEMENTS ANALYSIS OF CONCRETE DAMS</b> , Lecturer Tudor Salagean, Assist. Anca Maria Moscovici, PhD. Stud. Vlad Paunescu, Lecturer Mariana Calin, PhD. Stud. Elemer-Emanuel Suba, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, Romania .....	555
<b>70. RESTORATION AND CREATION OF PARTS OF THE LOST BUILDING DOCUMENTATION OF AN ARCHITECTURAL MONUMENT USING MODERN TECHNOLOGIES AND THEIR COMPARISON</b> , Martin Krupa, Roman Kapica, Dana Vrublova, Kristina Hreusova, VSB-Technical University of Ostrava, Czech Republic.....	561
<b>71. SOFTWARE SUPPORT FOR FREE GEODETIC NETWORKS ADJUSTMENT</b> , Assoc. Prof. Dr. Mladen Zrinjski, Sergej Baricevic, Prof. Dr. Duro Barkovic, Mia Lerinc, University of Zagreb, Croatia .....	569

<b>72. TELEMETRY MEASUREMENTS OF SHAFT TUBE INFLUENCED BY SEALING OF THE HOUSING, MSc Eng Mateusz Jablonski, Dr. Wojciech Jaskowski, Dr. Tomasz Lipecki, AGH University of Science and Technology, Poland.....</b>	577
<b>73. TESTING DISTANCE METERS IN DEPENDING ON THE ROTATION OF REFLECTING TARGET, Ing. Jaroslav Braun Ph.D., Ing. Petr Jasek, Czech Technical University in Prague, Czech Republic.....</b>	585
<b>74. TESTING OF A SMART ALGORITHM FOR GPS DATA PREDICTION TO FUSE THEM WITH THE HIGH RATE INERTIAL DATA IN A QUATERNIONIC MEMS-INS/GPS INTEGRATED NAVIGATOR, Teodor Lucian Grigorie, Costinel Laurentiu Corcău, University Of Craiova, Romania.....</b>	593
<b>75. THE ANALYSIS REGARDING THE STABILITY OF A CONSTRUCTION SITUATED ON A EARTHWORKING DIFFICULT TERRAIN, Assist. Prof. Drd. Cornel Arsene, Dr. Mircea Vasile Bondrea, Technical University of Cluj-Napoca, Romania.....</b>	601
<b>76. THE APPROPRIATENESS OF THE USE OF PARCEL REDUCTION COEFFICIENT TO ASSESS THE SPATIAL EFFECTS OF LAND CONSOLIDATION WORKS, M.Sc. Małgorzata Stanczuk-Gałwiaczek, Warsaw University of Technology, Poland.....</b>	609
<b>77. THE COMBINATION OF SENTINEL-1A AND SENTINEL-1B SAR DATA FOR GROUND DEFORMATION MONITORING WITHIN THE UPPER SILESIAN COAL BASIN, Mgr Inz. Radosław Murdzek, Dr Inz. Jacek Strzelczyk, Dr Inz. Stanisława Porzycka-Strzelczyk, AGH University of Science and Technology, Poland.....</b>	617
<b>78. THE COMMERCIAL CONSTRUCTION INDUSTRY IN WARSZAWA WITH RESPECT TO IMPLEMENTATION OF THE SUSTAINABLE DEVELOPMENT IDEAS, Assoc. Prof.Dr.Eng. Katarzyna Sobolewska - Mikulska, Warsaw University of Technology, Poland.....</b>	625
<b>79. THE DEVELOPMENT OF A SOFTWARE SUITE FOR PREDICTING ROCK BURSTS WITHIN THE FRAMEWORK OF A SYSTEM FOR ENSURING GEODINAMIC SAFETY OF MINING OPERATIONS, Dr. in the Field of Technical sciences, Sidorov Dmitriy, Dr. in the Field of Economics, Professor, Ponomarenko Tatiana, Saint-Petersburg Mining University, Russia .....</b>	633
<b>80. THE EXECUTION OF TOPOGRAPHIC WORKS FOR PLOTTING AXES AND BOLTS IN AN INDUSTRIAL BUILDING IN THE CITY OF TIMISOARA, ROMANIA, Lecturer Ph. D. Barliba Luminita Livia, Lecturer Ph. D. Hedrea C., Lecturer Ph. D. Barliba C., Associate Ph. D. Mircov Vlad Dragoslav, Student Barliba F. C., Banat University of Agronomical Sciences and Veterinary Medicine, Timisoara, Romania.....</b>	639

---

<b>81. THE EXECUTION OF TOPOGRAPHIC WORKS TOWARDS THE DEVELOPMENT AND MODERNISATION OF THE CENTRAL PARK IN HEALTH RESORT BAILE HERCULANE,</b> Lecturer Ph. D. Barliba Luminita Livia, Lecturer Ph. D. Hedrea C. , Lecturer Ph. D. Barliba C., Lecturer Ph. D. Smuleac A., Ph.D. Student Barliba F. C., Banat University of Agronomical Sciences and Veterinary Medicine, Timisoara, Romania .....	645
<b>82. THE IMPORTANCE OF INFORMATION IN THE PUBLIC REAL ESTATE MANAGEMENT,</b> Marta Gross, University of Warmia and Mazury in Olsztyn, Poland .....	653
<b>83. THE INFLUENCE OF LANDSCAPE DAMAGES RESULTING FROM THE PRESENCE OF TRANSMISSION DEVICES IN REAL ESTATE ON ITS VALUE – SITUATION IN POLAND,</b> Ph.D. Eng. Natalia Sajnog, Warsaw University of Technology, Poland.....	659
<b>84. THE ISSUE OF CONNECTING 3D BUILDING MODELS BASED ON ARCHITECTURAL DOCUMENTATION WITH THE STATE COORDINATE SYSTEM,</b> D.Sc. Ph.D. Marcin Karabin, D.Sc. Ph.D. Paweł Pedzich, Warsaw University of Technology, Poland.....	665
<b>85. THE LEVEL SURFACE OF THE GENERALIZED PROBLEM OF TWO CENTERS,</b> Prof. Dr. Valentin Gushchin, Assist. Prof. Dr. Adam Khasanov, Institute for Computer Aided Design of Russian Academy of Science, Moscow, Russia .....	673
<b>86. THE REGISTRATION OF REAL ESTATE THROUGH SYSTEMATIC CADASTRE,</b> Assoc. Prof. Dr. Eng. Luciana Oprea, 1 Decembrie 1918 University of Alba Iulia, Romania.....	681
<b>87. THE RELIABILITY OF PARCEL AREA,</b> Ing. Marek Bajtala, PhD., Ing. Lubica Hudecova, PhD., Prof. Ing. Stefan Sokol, PhD., Slovak University of Technology, Bratislava, Slovakia .....	689
<b>88. THE USAGE OF TELEMETRY MEASUREMENT METHODS IN ORDER TO DETERMINE SHAFT TUBE DEFORMATIONS,</b> MSc Eng Mateusz Jablonski, Dr. Wojciech Jaskowski, AGH University of Science and Technology, Poland .....	697
<b>89. THE USE OF LIDAR DATA AND CADASTRAL DATABASES IN THE IDENTIFICATION OF LAND ABANDONMENT,</b> Piotr Bozek, Jarosław Janus, Jarosław Taszakowski, Agnieszka Glowacka, University of Agriculture in Krakow, Poland .....	705
<b>90. THE USE OF TERRESTRIAL LASER SCANNING FOR INVENTORY OF ELEMENTS OF INDUSTRIAL INFRASTRUCTURE - A CASE STUDY,</b> Jakub Stefan Markiewicz, MSc Ing., Anna Adamek, MSc Ing., Warsaw University of Technology, Poland .....	713

<b>91. THE USE OF UAVS FOR REAL ESTATE VALIDATION.,</b> Assoc.Prof.Dr.Eng. Katarzyna Sobolewska - Mikulska, Warsaw University of Technology, Poland .....	721
<b>92. THE VISUAL ASSESSMENT OF THE CONDITION OF SHAFT LINING AND SHAFT REINFORCEMENT EQUIPMENT USING A VIDEO MONITORING SYSTEM,</b> PhD Wojciech Jaskowski, PhD Tomasz Lipecki, PhD Pawel Cwiakala, MSc Wojciech Matwij, AGH University of Science and Technology, Poland.....	727
<b>93. TOPOGRAPHICAL METHOD USED IN SETTLEMENT OF DISPUTES REGARDING DEGRADATION OF SOME PROPERTIES,</b> Ioel Veres, Larisa Filip, University of Petrosani, Romania .....	735
<b>94. UNIVERSAL MEASURING STATION TESTING IN ACCORDANCE WITH INTERNATIONAL TECHNICAL STANDARDS,</b> Ing. Jan Jezko, PhD., Slovak University of Technology, Bratislava, Slovakia.....	741
<b>95. USING CORNER REFLECTORS AS GROUND CONTROL POINTS IN GROUND BASED SAR INTERFEROMETRY,</b> Anna Szafarczyk, AGH - University of Science and Technology, Poland .....	749
<b>96. VECTOR TRACKING LOOPS FOR GNSS SIGNAL PROCESSING UNDER INTERFERENCE AND MULTIPATH CONDITIONS,</b> Alexandru Rusu, University Politehnica of Bucharest, Romania.....	757
<b>97. VERTICALITY OF THE HEADFRAME OF WORKING SHAFT NO. 6 AT THE LAZY SITE,</b> Eva Jirankova, Roman Kapica, Dana Vrublova, VSB-Technical University of Ostrava, Czech Republic .....	765