INFORMATICS, GEOINFORMATICS AND REMOTE SENSING
CONFERENCE PROCEEDINGS
VOLUME I

INFORMATICS, GEOINFORMATICS
PHOTOGRAMMETRY AND REMOTE SENSING

18-24, June, 2015
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 2015 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 © SGEM2015
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

ISSN 1314-2704
DOI: 10.5593/sgem2015B21

INTERNATIONAL MULTIDISCIPLINARY SCIENTIFIC GEOCONFERENCE SGEM
Secretariat Bureau
Phone: +359 2 4051 841
Fax: +359 2 4051 865
E-mails: sgem@sgem.org | sgem@stef92.com
URL: www.sgem.org
ORGANIZERS

- BULGARIAN ACADEMY OF SCIENCES
- ACADEMY OF SCIENCES OF THE CZECH REPUBLIC
- 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
- BULGARIAN INDUSTRIAL ASSOCIATION
- BULGARIAN MINISTRY OF ENVIRONMENT AND WATER

HONORED ORGANIZER

BULGARIAN ACADEMY OF SCIENCES

EXCLUSIVE SUPPORTING PARTNER

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. DR. JÓZSEF ÁDAM, HUNGARY
- PROF. RUI MIGUEL MARQUES MOURA, PORTUGAL
- PROF. DR. ING. KAREL PAVELKA, CZECH REPUBLIC
- PROF. DR. MARCEL MOJZES, SLOVAKIA
- ASSOC. PROF. DR MILAN HOREMUZ, SWEDEN
- DR. TIBERIU RUS, ROMANIA
- DR. MARKO KREVS, SLOVENIA
CONFERENCE PROCEEDINGS CONTENTS

INFORMATICS


2. A SIMULATION PLATFORM FOR ATMOSPHERIC PHENOMENA STUDY WITHIN COASTAL FLOODS IN BALTIC SEA AREA, Alexander A Visheratin, Denis Nasonov, Anna V Kalyuzhnaya, Sergey S Kosukhin, University ITMO, Russia..11

3. ADVANCED COMMUNICATION APPROACH BETWEEN CROSS-PLATFORM MOBILE AND DESKTOP APPLICATIONS IN MEDICAL PURPOSES, M.Sc Dalibor Serafimovski, Full Prof. Vlado Gicev, M.Sc Boris Panajotov, University Goce Delcev, FYR of Macedonia ........................................19

4. ANALYSIS OF STUDENT'S BEHAVIOR IN LMS ELOGIKA, MSc. Marek Mensik, PhD, MSc. Pavla Drazdilova, PhD, VSB-Technical University of Ostrava, Czech Republic ........................................................................................................27

5. ANALYSIS OF THE IMPACT OF DATA FLOW TYPE ON THE QUALITY OF SERVICE OF INFORMATION SYSTEMS, E.V. Ireeva, I.V. Kalinin, L.A. Muravyeva-Vitkovskaya, University ITMO, Russia ..........................................................35

6. APPLICATION FOR PROCESSING OF MASS DATA FOR ENVIRONMENTAL IMPACTS MONITORING FROM MUNICIPAL WASTE INCINERATION, Marcela Malindzakova, Andrea Rosova, Martin Straka, Nikoleta Husakova, Lubica Kozakova, Technical University of Kosice, Slovakia .......................41

7. APPLICATION OF DATA MINING TECHNIQUES TO DETECT FRAUD IN THE HOUSING SECTOR, Assoc. Prof. Dr. Marina Medvedeva, Evgeniy Komotskiy, Ural Federal University, Russia .........................................................................................49

8. BIG DATA PRIVACY CONCERNS AMIDST GLOBAL DEVELOPMENT, Dr. Emanuel Tundrea, Prof. Dr. Gerhard Steinke, Assoc. Prof. Dr. Ryan C. LaBrie, Emanuel University of Oradea, Romania.................................................................53


10. COMPARATIVE ANALYSIS OF ONLINE PROMOTION METHODS. CASE STUDY: LIDL ROMANIA VERSUS KAUF LAND ROMANIA, Lecturer Dr. Sebastian Moisa, Banat University of Agronomical Sciences and Veterinary Medicine, Romania......................................................................................................................69


13. DESIGNING A FEEDFORWARD NEURAL NETWORK FOR WELDING CONTROL IN OIL AND GAS INDUSTRY EQUIPMENT, Dr. Gabriela Bucur, Assoc. Prof. Dr. Adrian Moise, Assoc. Prof. Dr. Otilia Cangea, Dr. Cristina Popescu, Petroleum-Gas University of Ploiesti, Romania.........................................................93

14. DEVELOPMENT OF AUTOMATED INFORMATION SYSTEMS FOR MONITORING OF INTELLECTUAL ACTIVITY RESULTS, Prof. Dr. A.V. Ostroukh, Prof. Dr. M.N. Krasnyanskiy, A.D. Obukhov, S.V. Karpov, D.L. Dedov, Moscow Automobile and Road construction State Technical University, Russia.........101


16. ECOLOGICAL PLA PLASTIC USED FOR FDM RAPID PROTOTYPING TECHNOLOGY, Assoc. Prof. Juraj Beniak, Assoc. Prof. Peter Krizan, Milos Matus, Michal Svatек, Slovak University of Technology Bratislava, Slovakia .........................117

17. EVALUATION OPERATOR PILOT SKILL IN LEARNING PROCESS, Ing. Pavol Kurdel PhD., Prof. Ing. Frantisek Adamcik CSc., Assoc. Prof. Ing. Jan Labun PhD., Technical University of Kosice, Slovakia.................................................125


19. INFORMATION SYSTEM OF GROUNDWATER MONITORING, Zhanar Beldeubayeva, Saule Rakhmetullinab, Erken Turganbayev, Vladimir Krivykh, East Kazakhstan State Technical University named after D.Serikbayev, Kazakhstan... ......139

20. INTEGRATED SAFETY MANAGEMENT SUPPORT SYSTEM FOR WARMIA AND MAZURY REGION, Eliza Sitnik, Assoc. Prof. Ryszard Myhan, Adam Korpusik, Karolina Szturo, Lukasz Tomczyk, University of Warmia and Mazury, Poland.................................................................147
21. INTELLIGENT DECISION MAKING BASED ON QUERIES WITH PRESUPPOSITION IN MAS, MSc. Marek Mensik, PhD, PHDr. Martina Cihalova, PhD, VSB-Technical University of Ostrava, Czech Republic ..............................................155

22. INTELLIGENT TRANSPORTATION SYSTEMS. CASE STUDY, Assoc. Prof. Dr. Otilia Cangea, Assoc. Prof. Dr. Adrian Moise, Assoc. Prof. Dr. Gabriela Bucur, Assoc. Prof. Dr. Cristina Popescu, Petroleum-Gas University of Ploiesti, Romania....167

23. INTERACTIVE E-SCIENCE CYBERINFRASTRUCTURE FOR WORKFLOW MANAGEMENT COUPLED WITH BIG DATA TECHNOLOGY, Denis Nasonov, Alexander A Visheratin, Konstantin V. Knyazkov, Sergey V. Kovalchuk, University ITMO, Russia.................................................................175

24. LOGISTIC CHAIN DATA PROCESSING, Assoc. Prof. Oldrich Kodym, Dr. Libor Kavka, Dr. Michal Sedlacek, College of Logistics, Czech Republic.........................183

25. MATHEMATICAL SOFTWARE FOR E-LEARNING SYSTEMS IN MECHANICAL ENGINEERING, Prof. Dr. Vladimir Nemtinov, Prof. Dr. Mikhail Krasnyanskiy, Assoc. Prof. Andrey Borisenko, Assoc. Prof. Yulia Nemtinova, Prof. Dr. Sergey Karpushkin, Tambov State Technical University-Technological institute, Russia.................................191

26. MESHFREE APPROXIMATION OF FUNCTIONS, Assoc. Prof. Victoria Elena Rosca, Prof. Elena Axinte, Assoc. Prof. Carmen Elena Telean, Assist. Georgeta Baetu, Gheorghe Asachi Technical University of Iasi, Romania.................................199

27. MONITORING SYSTEM OF THE ANNEALING PROCESS WITH USING POWER PANEL PP 65, Milan Durdan, Jan Kacur, Assoc. Prof. Marek Laciat, Technical University of Kosice, Slovakia..........................................................207


29. ON DEVELOPMENT OF THE SPACECRAFT CONTROL SYSTEM'S STRUCTURE, Assoc. Prof. Roman Yu. Tsarev, Assoc. Prof. Alexander N. Pupkov, Assist. Prof. Alexander V. Prokopenko, Assoc. Prof. Alexey N. Knyazkov, Siberian Federal University, Russia.................................................................225

30. ON ENTROPY OF ALMOST ORTHOGONAL POLYNOMIALS OF LAGUERRE TYPE, Prof. Predrag Rajkovic, Vojkan Miljkovic, Kostadin Rajkovic, University of Nis, Faculty of Technology in Leskovac, Serbia ........................................233

31. ONE RUNWAY AIRPORT SEPARATIONS, Ing. Matej Antosko PhD., Ing. Peter Korba PhD., Ing. Jozef Sabo PhD., Technical University of Kosice, Slovakia...241

33. POSSIBLE BUSINESS ASPECTS OF APPLICATION OF INTELLIGENT SYSTEMS IN SMALL AND MEDIUM ENTERPRISES IN SERBIA, Assoc. Prof. Dr. Nebojsa Denić, Vesna Stevanović, Violeta Milicevic, Rasic Goran, Alfa University Belgrade Faculty of Information Technology, Serbia......................................................257

34. REASONING WITH PLACE INFORMATION ON THE LINKED DATA WEB, Khalid Almuzaini, Alia Abdelmoty, Cardiff University, United Kingdom......265

35. RESEARCH OF GEOGRAPHIC INFORMATION SYSTEMS AT CREATION 3D MODELS, Kirgizbaeva Dinara M., Kurmanbayev Ölżhas S., Nurpeisova Maržhan, Kazakh National Technical University Named After K. I. Satpayev, Kazakhstan............................................................281


37. SIMULATED OPERATION OF THE COMPUTER NETWORK, Prof. A. V. Ostroukh, Assist. Prof. K. N. Mezencev, Prof. M. N. Krasnyanskiy, Jha Punam, Assist. Prof. N. E. Surkova, Moscow Automobile and Road construction State Technical University, Russia.................................................................299

38. SOFTWARE ENGINEERING PRINCIPLES FOR CREATING A WEB-ORIENTED DATABASE OF GENES, Dr. Emanuel Tundrea, Emanuel University of Oradea, Romania ..................................................................................307

39. SPREADSHEET AS A MEANS TO SUPPORT A TIMETABLE SCHEDULING PROCESS WITH REFERENCE TO THE EXAMPLE OF A COURSE ENTITLED WITH REFERENCE TO THE EXAMPLE OF A COURSE ENTITLED “EDUCATION OF SPECIALISTS IN THE FIELD OF MANAGEMENT OF POST-MINING AREAS IN THE POLISH-CZECH BORDERLAND”, PhD Bartosz Szczeniak, PhD Krzysztof Michalski, Silesian University of Technology, Poland.................................................................315

40. STUDY OF TRANSIENT INDUCTIVE-CAPACITIVE CIRCUITS USING DATA ACQUISITION SYSTEMS, Lecturer PhD. Eng. Dragos Pasculescu, Assoc. Prof. PhD. Eng. Titu Niculescu, University of Petrosani, Romania........................................323
41. STUDY ON DEVELOPING A WEB APPLICATION FOR HOTEL BOOKING ON THE SHORE OF THE BLACK SEA, Sabin Mihai Simionescu, Cristian Vasile, University Of Craiova, Romania .......................................................... 331

42. TECHNOLOGY OF USING PROPERTIES AND MECHANISMS OF ACTIONS IN USER INTERFACE DESIGN, Assist. Prof. Svetlana Belousova, Prof. Dr. Yury Rogozov, Assoc. Prof. Dr. Alexander Sviridov, Southern Federal University, Russia .................................................................................................................. 339

43. TECNOMATIX FOR SUCCESSFUL APPLICATION IN THE AREA OF SIMULATION MANUFACTURING AND ERGONOMICS, Ing. Michal Hovanec PhD., Ing. Peter Korba, PhD., Assoc. Prof. Marek Sole, PhD., Technical University of Kosice, Slovakia .................................................................................................................. 347

44. THE APPROACH TO THE CONFIGURABLE SYSTEM CONSTRUCTION BASED ON A METHODOLOGICAL APPROACH, Prof. Yury Rogozov, Assoc. Prof. Alexander Sviridov, Southern Federal University, Russia ................................................................. 353

45. THE APPROACH TO THE INFORMATION SYSTEMS DESIGN BASED ON THE PROPERTIES OF THE DOMAIN, Assist. Prof. Alexander Belikov, Prof. Dr. Yury Rogozov, Assoc. Prof. Dr. Alexander Sviridov, Southern Federal University, Russia .................................................................................................................. 361

46. THE INFLUENCE OF ONLINE ADVERTISING ON THE BEHAVIOR OF FOOD PRODUCTS CONSUMER ON THE MARKET OF TIMIS COUNTY, Lecturer Dr. Sebastian Moisa, Banat University of Agronomical Sciences and Veterinary Medicine, Romania .................................................................................. 367

47. THE INVESTIGATION OF UCG CONTROL METHODS, Jan Kacur, Milan Durdan, Technical University of Kosice, Slovakia ................................................................. 375


49. USE OF NUMERICAL SIMULATION TO STUDY CAPACITIVE LOADS WHICH IS CONNECTING TO AN AC POWER SOURCE, Assoc. Prof. PhD. Eng. Titu Niculescu, Lecturer PhD. Eng. Dragos Pascaulescu, University of Petrosani, Romania .................................................................................................................. 391

50. USING PARTICLE SWARM OPTIMIZATION ALGORITHM FOR PARAMETER ESTIMATION IN HYDROLOGICAL MODELLING, Ing. Michala Jakubcova, Czech University of Life Sciences - Prague, Czech Republic .... 399

51. USING SELECTIVE MEMORY PERFORMANCE EVALUATION FOR TIME-CRITICAL EMBEDDED SYSTEMS DESIGN, Assoc. Prof. Pavel Kustarev, Alexander Antonov, Vasilyi Pinkevich, Roman Yanalov, University ITMO, Russia.. 407
52. WIRELESS APPLICATION FOR MECHANICAL TRANSMISSION STUDY, Assoc. Prof. Florin Gofu, Constantin Cercel, Gheorghe Dragut, Constantin Brancusi University of Targu-Jiu, Romania ................................................................. 415

GEOINFORMATICS

53. 3D DENSITY MODELS CONSTRUCTION METHOD FOR LAYERED MEDIA, Prof. Martyshto P.S., Byzov D.D., Ladovskiy I.V., Tsidaev A.G., Institute of Geophysics UB RAS, Russia ........................................................................................................... 425

54. A TECHNIQUE OF SPATIO-TEMPORAL ANALYSIS OF DARKNEEDLE STANDS DESICCATION BASED ON LANDSAT REMOTE SENSING DATA, PhD Sergei Im, Institute of Forest SB RAS, Russia ................................................................. 433

55. AGGREGATE INDICES METHOD FOR CHOICE OF DANGER PREVENTION STRATEGY IN GIS-BASED MONITORING SYSTEM, Yan Ivakin, Misha Tsvetkov, St. Petersburg Institute for Information and Automation, Russia ........................................................................................................... 441

56. ANALYSIS OF ATMOSPHERIC AIR POLLUTION DEPOSITION TO SOIL ENVIRONMENT: THE MASOVIAN VOIVODESHIP CASE STUDY, Assoc. Prof. PhD DSc eng. Jolanta Kwiatkowska-Malina, MSc. eng. Andrzei Szymon Borkowski, Warsaw University of Technology - Faculty of Geodesy and Cartography, Poland ........................................................................................................... 451


58. ANFIS MODEL FOR LANDSLIDE RISK MANAGEMENT, Assist.Prof. Jasna Pleho, Prof. Zikrija Avdagic, Arch Design d.o.o., Bosnia and Herzegovina .............. 471

59. APPLICATION OF GEOBROWSERS TO 2D/3D-VISUALIZATION OF GEOMAGNETIC FIELD, Accoc. Prof. Dr. Andrei V. Vorobel, Assoc. Prof. Dr. Gulnara R. Shakirova, Ufa State Aviation Technical University - Computer Science and Robotics Department, Russia ........................................................................................................... 479

60. APPLIED SOFTWARE TOOLS AND SERVICES FOR RAPID WEB GIS DEVELOPMENT, Dr. Oleg Yakubailik, Dr. Alexey Kadochnikov, Dr. Alexey Tokarev, Institute of Computational Modelling SB RAS, Russia ................................................................. 487

61. ARCHITECTURAL AND TOURISM POTENTIAL OF TIMISOARA, ROMANIA HIGHLIGHTED BY WEBGIS SOLUTIONS, PhD Oana Grecea, PhD Sorin Herban, PhD Adrian Alionscu, Politehnica University of Timisoara, Romania .............................................................................. 495
62. ARTIFICIAL INTELLIGENCE IN MODELLING OF SURFACE SUBSIDENCE DUE TO WATER WITHDRAWAL IN UNDERGROUND MINING, Wojciech T. Witkowski, AGH University of Science and Technology, Poland .................................................................503

63. AUTOMATED COST ESTIMATING METHODOLOGY FOR MODERN METHODS OF CONSTRUCTION, Assoc. Prof. Peter Mésaros, Juraj Talian, Daniela Mackova, Tomas Mandicak, Technical University of Kosice, Slovakia ..................511

64. AUTOMATIC WATER BODY EXTRACTION FROM REMOTE SENSING IMAGES USING ENTROPY, Dr. Julia Aahlen, Prof. Stefan Seipel, University of Gaevle Department of Industrial Development IT and Land Management, Sweden ...517

65. CLOUD BASED GEOSPATIAL SUPPORT FOR ECOSYSTEM SERVICES EVALUATION IN SLOVAKIA - A STUDY CASE OF SDI4APPS PROJECT, Dr. Martin Tuchyna, Dr. Tomas Kliment, Peter Pastorek, Dr. Branislav Krsak, Zuzana Okanikova, University of Zagreb, Faculty of Geodesy, Croatia ..................525

66. COMMUNICATION DISTANCE OF JENNIC WIRELESS NODES IN THE SMALL AREA, Vendula Hejlova, Tomas Pohanka, Vilem Pechanec, Walter Buttazz, Chukwudi Nwaogu, Palacky University in Olomouc, Czech Republic ..................533

67. COMPARISON OF THE FILTERING METHODS IN CLEANING DATA OBTAINED FROM LASER SCANNER, Dr Anna Pieta, MSc Krzysztof Kloczek, AGH University of Science and Technology, Poland .................................................................541

68. COMPLETE 3D LANDSCAPE RECONSTRUCTION BASED ON HISTORICAL DATA SOURCES, Dr. Jan Pacina, Dr. Jiri Cajthaml, Vladimir Bruna, J. E. Purkyne University in Usti nad Labem, Czech Republic .................................................................547

69. CONCEPT OF A MODEL DATABASE ENABLING DATA STORAGE FOR PURPOSES OF INVESTMENT ATTRACTIVENESS ASSESSMENT OF DEGRADED POST-MINING AREAS, PhD Krzysztof Michalski, PhD Bartosz Szczesniak, Silesian University of Technology, Poland .................................................................555

70. DEVELOPMENT OF METHODS FOR ESTIMATING PARAMETERS OF NATURAL EMERGENCY PHENOMENA USING SATELLITE REMOTE SENSING DATA AND GIS TECHNOLOGIES, Assoc. Prof. Alexander V. Ivanov, Prof. Yulia I. Troitskaya, Senior Resercher Daniil. A. Sergeev, Senior Lecturer Svetlana V. Rodioinova, Nizhny Novgorod State University of Architecture and Civil Engineering, Russia .................................................................563

71. DIGITALIZATION OF RAILWAY SYSTEM FOR MOBILE APPLICATIONS, Enis Berisha, Berat Sinani, University of Prishtina “Hasan Prishtina”, Kosovo .................................................................571
72. ELIMINATING DUPLICATE AND INCONSISTENT INFORMATION IN OPENSTREETMAP GEOGRAPHIC DATA, Assoc. Prof. Alexander N. Pupkov, PhD student Dmitry N. Aldoshkin, Assoc. Prof. Roman Yu. Tsarev, Assoc. Prof. Alexey N. Knyazkov, Siberian Federal University, Russia ........................................577

73. EYE-TRACKING TESTING OF GIS INTERFACES, Bc. Vaclav Kudelka, Ing. Zdena Dobesova Ph.D., Palacky University in Olomouc, Czech Republic .............................585

74. FREQUENCY ANALYSIS OF PUBLIC TRANSPORT BETWEEN CZECH MUNICIPALITIES, Eng. Jan Tesla, Doc. Dr. Eng. Jiri Horak, Eng. Igor Ivan, PhD, VSB-Technical University of Ostrava, Czech Republic .............................................593

75. GEOINFORMATION DATABASE FOR SUBSIDENCE MODELING DUE TO WATER WITHDRAWAL, Wojciech T. Witkowski, AGH University of Science and Technology, Poland ..................................................................................601

76. GEOINFORMATION MANAGEMENT AS A MODERN APPROACH TO THE MANAGEMENT OF SPATIALLY-DISTRIBUTED SYSTEMS AND TERRITORIES, Prof. DSc. E. P. Istomin, Assoc. Prof DSc. A. G. Sokolov, Assoc. Prof. DSc. V. M. Abramov, Assoc. Prof. DSc. G. G. Gogoberidze, PhD N.N. Popov, Russian State Hydrometeorological University, Russia .............................................607

77. GIS LAYER CREATION FOR AGRIENVIRONMENTAL SUB-MEASURE: BIODIVERSITY CONSERVATION WITHIN THE RURAL DEVELOPMENT PROGRAMME OF THE SLOVAK REPUBLIC 2007-2013, PhD. Adriana Zverkova, PhD. Martina Zverkova, PhD. Jana Mitrikova, PhD. Daniela Matusikova, PhD. Anna Senkova, University of Presov in Presov, Slovakia ..................615

78. GIS TOOLS FOR FOREST PRODUCTION OPTIMIZATION IN MOUNTAINOUS AREAS: THE SLOPE PROJECT, Daniele Magliocchetti, Giulio Panizzoni, Federico Prandi, Raffaele De Amicis, GraphiTech, Italy .................................................625

79. GML – DOES IT REALLY WORK IN PRACTICE?, PhD Agnieszka Chojka, University of Warmia and Mazury, Poland .............................................................................633

80. GNSS L1 POSITIONING WITH SBAS, Maciej Wrona, Military University of Technology Applied Geomatics center, Poland .......................................................................641

81. GPU IMPLEMENTATION OF DBSCAN ALGORITHM FOR SEARCHING MULTIPLE ACCIDENT BLACK SPOTS, Dr. Sandor Szenasi, Obuda University, Hungary ..........................................................................................647

82. HAILIERR'S PORTAL: A WEB-BASED GIS SERVICE FOR FREIGHT CONNECTION SEARCH, Tomas Peltan, Czech University of Life Sciences - Prague, Czech Republic ..................................................653

83. HAZARD AND LAND MANAGEMENT METHODS, Rodney L. Stevens, University of Gothenburg, Sweden ...................................................................................661
84. HYBRID GEOPROCESSING WEB SERVICES, Evgeny Panidi, Eduard Kazakov, Evgeny Kapralov, Anton Terekhov, Saint-Petersburg State University, Russia

85. IMPROVING OF TRANSMISSIVITY MAPS FOR HYDROGEOLOGICAL MODEL OF LATVIA, Dr.sc.ing. Aivars Spalvins, Dr.geol. Olgerts Aleksans, Inta Lace, Riga Technical University, Latvia

86. INFORMATION-ANALYTICAL SYSTEM OF ENVIRONMENTAL MONITORING, Dr Maxim Medvedev, Ural Federal University, Russia

87. INTELLECTUAL GIS TECHNOLOGIES IN HISTORICAL AND ETHNOGRAPHIC RESEARCH, Yan Ivakin, Misha Tsvetkov, Vladislav Ivakin, St. Petersburg Institute for Information and Automation, Russia

88. INTERACTIVE SYSTEM FOR ENVIRONMENTAL MONITORING OF TRAFFIC JAM, Assoc. Prof. Alexander V. Ivanov, Assoc. Prof. Alexander Yu. Platov, Graduate student Marina S. Belyakova, Master student Ekaterina A. Kaminskas, Nizhny Novgorod State University of Architecture and Civil Engineering, Russia

89. MANAGING RURAL AREAS CONSIDERING CLIMATE CHANGES AND EXTRAORDINARY WEATHER PHENOMENA – A CONCEPT OF SOLUTIONS ON A LOCAL SCALE, Kocur-Bera Katarzyna, Dudzinska Malgorzata, University of Warmia and Mazury, Poland

90. MAPPING HEAVY METAL CONTAMINATION BY KRIGING IN VALEA SESEI TAILING POND, ROMANIA, Cornelia Melenti, PhD. Ioana Laura Magyar, Technical University of Cluj-Napoca, Romania

91. MERCURY CONTENT AS A PART OF A MULTI-CRITERIA ANALYSIS OF INVESTMENT POTENTIAL OF POST-MINING AREAS, PhD Anna Michalska, PhD Krzysztof Michalski, Central Mining Institute (GIG), Poland

92. METHODS FOR EXTERNAL FACTORS ASSESSING WITHIN GEOINFORMATION MANAGEMENT OF TERRITORIES, Prof. DSc. E. P. Istomin, Assoc. Prof DSc. A. G. Sokolov, Assoc. Prof. DSc. V. M. Abramov, Assoc. Prof. DSc. G. G. Gogoberidze, PhD A.A. Fokicheva, Russian State Hydrometeorological University, Russia

93. MINERAL AND ANTHROPOGENE ACCESS DATABASES ORGANIZATION FOR ALSHAR POLYMETALLIC DEPOSIT AND WASTE DUMP, FYR OF MACEDONIA, M.Sc Dalibor Serafimovski, Prof. Vlado Gicev Prof. Kosta Mitreski, University Goce Delcev, FYR of Macedonia

94. MODELING OF DECISION SUPPORT SYSTEM FOR SPATIAL PLANNING BASED ON ANFIS MODEL, Assist. Prof. Jasna Pleho, Prof. Zikrija Avdagic, Arch Design d.o.o., Bosnia and Herzegovina
95. MULTI-GNSS REAL-TIME PRECISE POSITIONING FOR PEDESTRIAN LANE DETECTION, Dr. Octavian Andrei, BSc Dhasorn Chinvorapanay, Chulalongkorn University - School of Engineering, Thailand ........................................753

96. OBSERVATION AS A BASIC QUALITATIVE METHOD IN TOURISM RESEARCH. CASE STUDY OF TOURIST DESTINATION DONOVALY IN SLOVAKIA, Assoc. Prof. Peter Cuka, PhD., Assoc. Prof. Zygmund Kruczek, PhD., Assoc. Prof. Adam Szromek, PhD., College of Business and Hotel Management, Czech Republic ..........................................................761

97. PLANAR SLIDING WINDOW TECHNIQUE FOR SEARCHING ACCIDENT HOT SPOTS, Dr. Sandor Szenasi, Dr. Peter Csiba, J. Selye University, Slovakia ..........................................................767

98. PRACTICAL APPLICATION OF GIS IN KOSOVO, APPLICATION STRATEGY, Asoc. Prof. Dr. Florim Isufi, Asoc. Prof. Dr. Shpejtim Bulliqi, Ardan Isufi Msc candidate, University of Prishtina “Hasan Prishtina”, Kosovo ..................................773

99. RAILWAY TRACKS 3D MAPPING WITH STRUCTURED LIGHT METHOD, Maciej Wrona, Military University of Technology Applied Geomatics center, Poland ..........................................................779

100. ROAD NETWORK DEVELOPMENT ANALYSIS IN AREAS AFFECTED BY OPEN-PIT MINING, Dr. Jan Pacina, Dr. Jan Popelka, Petr Novak, J. E. Purkyne University in Usti nad Labem, Czech Republic ........................................785

101. SMART HOUSING ESTATE: IMPLEMENTATION OF ICT USER FRIENDLY APPLICATION TO RAISE INHABITANT’S SUSTAINABILITY AWARENESS, Tomas Volarik, Robert Wawerka, Stanislava Dermekova, Brno University of Technology Faculty of Civil Engineering, Czech Republic ........................................793

102. SPATIAL INFORMATION RECORDING PROCEDURE INVOLVING METHODS OF CLOSE RANGE PHOTOGRAMMETRY AS APPLIED TO ARCHAEOLOGICAL RESEARCHES, Assist. Prof. Alexander Starovoytov, Assoc. Prof. Guzel Saifutdinova, Kazan (Volga Region) Federal University, Russia ..................................801

103. SPATIAL VISUALIZATION OF ENVIRONMENTAL ISSUES, Medjon Hysenaj, University of Shkoder, Albania .................................807

104. SPATIO-TEMPORAL ACCESSIBILITY ANALYSIS OF SOCIAL SERVICES OF THE KARLOVY VARY REGION, Mgr. Pavla Dedkova, Palacky University in Olomouc, Czech Republic .............................................................815

105. STANDARDIZATION OF LAND CONSOLIDATION DATA IN THE CZECH REPUBLIC, Eng. Arnost Muller, CTU in Prague, Czech Republic ........823
106. SUBSIDENCE TROUGHS DETECTION FOR SAR IMAGES - PRELIMINARY RESULTS, PhD Justyna Bala, PhD Stanisława Porzycka-Strzelczyk, MSc Jacek Strzelczyk, AGH University of Science and Technology, Poland.............829

107. SYNCHRONIZATION AND REPLICATION OF GEODATA IN THE ESRI PLATFORM, MSc. Tomas Pohanka, Assoc. Prof. Vílem Pechanec, MSc. Marketa Solanska, Palacky University in Olomouc, Czech Republic...............................837

108. TECHNIQUE OF CREATION INTERACTIVE VISUALIZATION OF 3D MAPS WITHIN THE UNIVERSITY CAMPUS, Yerkin Kakimzhanov, Zhenis Kozhaev, Saule Bektemirova, al-Faraby Kazakh National University, Kazakhstan.....845

109. TESTING ACCURACY OF POLISH NATIONAL WAAS RTK SERVICE, Maciej Wrona, Military University of Technology Applied Geomatics Center, Poland .................................................................851

110. THE CALCULATION OF THE ROAD ZONE EFFECT AND ITS IMPACT ON CARBON SEQUESTRATION IN THE LANDSCAPE, Assoc. Prof. Vílem Pechanec, Mgr. Jan Purkyt, Assoc. Prof. Pavel Cudlin, Palacky University in Olomouc, Czech Republic.................................................................859

111. THE KERNEL DENSITY ESTIMATION FOR THE VISUALIZATION OF SPATIAL PATTERNS IN URBAN STUDIES, Raul-T Mora-Garcia, M-Francesca Cespedes-Lopez, Juan-Carlos Perez-Sanchez, Raul Perez-Sanchez, University of Alicante, Spain .................................................................867

112. THE PRECISION OF THE GPS POSITIONING SYSTEM AND GPS PHASE OBSERVATIONS COMPENSATION BY LEAST SQUARES METHOD, Associate Ph. D. Popescu Cosmin, Associate Ph. D. Dragomir Lucian, Lecturer Ph. D. Filip Ofelia Larisa, Banat University of Agronomical Sciences and Veterinary Medicine, Romania.................................................................875

113. THE USE OF CITYGML STANDARD IN THE CONTEXT OF CREATING SMART CITIES, M.Sc.Eng. Katarzyna Gozdz, Prof. Dr Eng. Wojciech Pachelski, Military University of Technology Faculty of Civil Engineering and Geodesy, Poland.................................................................883

114. THE USE OF WEBSERVICES IN PUBLIC ADMINISTRATION IN POLAND, Dr. Karol Szuniewicz, Dr. Iwona Cieslak, Mst. Szymon Czyza, University of Warmia and Mazury, Poland.................................................................891

115. USAGE OF HEURISTIC ALGORITHM FOR OPTIMIZATION OF PRECISE GNSS RTK MEASUREMENT, Assoc. Prof. Dalibor Bartonek, Ing. Jiri Bures, PhD., Brno University of Technology, Czech Republic ............899

116. USING GNSS KINEMATIC PPP METHOD FOR VEHICLE POSITIONING, Maciej Wrona, Military University of Technology Applied Geomatics center, Poland .................................................................907
117. VISUALIZATION OF THE KARST DEVELOPMENT DYNAMICS BY SPATIAL-TEMPORAL MAPS, Assoc. Prof. Ruslan Sharapov, Murom Institute of Vladimir State University, Russia .................................................................913

118. WORKFLOW FOR THE HOMOGENISATION OF CLIMATE DATA USING GEOSTATISTICAL SIMULATION, Julio Caineta, Sara Ribeiro, Amilcar Soares, Ana Cristina Costa, ISEGI Universidade Nova de Lisboa, Portugal.............921

PHOTOGRAMMETRY AND REMOTE SENSING

119. ACCURACY ASSESSMENT OF DIGITAL ELEVATION MODELS DERIVED WITH CONTEMPORARY SATELLITE TECHNOLOGIES, MSc Piotr Janusz Koza, MSc Sebastian Rozycki, PhD Katarzyna Osinska-Skotak, Warsaw University of Technology - Faculty of Geodesy and Cartography, Poland ..................933

120. AERIAL TOPOGRAPHIC SURVEY OF SMALL AREAS BY “LOW-COST” DIGITAL CAMERA CANON EOS 5D, Marcel Kliment, Michaela Bulikova, Tomas Kliment, Vlado Cetl, Jakub Kocica, Slovak Agriculture University in Nitra, Slovakia...........................................................941

121. AIRBORNE LIDAR TOPOGRAPHICAL SURVEYING, Associate Ph. D. Popescu Cosmin, Associate Ph. D. Dragomir Lucian, Lecturer Ph. D. Filip Ofelia Larisa, Banat University of Agronomical Sciences and Veterinary Medicine, Romania.................................................................949

122. AIRBORNE REMOTE SENSING ACTIVITIES IN ALBANIA FOR MULTITEMPORAL VEGETATION MONITORING, Carmine Gambardella, Nicola Pisacane, Alessandra Avella, Pasquale Argenziano, Carmine Maffei, Second University of Naples Department of Architecture and Industrial Design, Italy.............957

123. ANALYSIS OF FOG EVENTS AT MAGURELE – ROMANIA USING GROUND BASED EQUIPMENTS AND AIR CIRCULATION, PhD Toanca Florica, PhD Stefanie Horatiu, PhD Andrei Simona, PhD Barbu Nicu, PhD Nicolae Doina, National Institute for Research and Development in Optoelectronics, Romania .................................................................965

124. ANALYSIS OF POSSIBILITIES AND CONSTRAINTS OF USING ERS-1, ERS-2 AND ENVISAT RADAR DATA IN THE PROCESS OF URBAN AREAS GROWTH MONITORING, Piotr Opido, Andrzej Lesnial, AGH University of Science and Technology, Poland.................................973


127. ARTIFICIAL MODEL IN THE ASSESSMENT OF THE ALGORITHM OF OBJECTS RECORDED BY LASER SCANNING SHAPE DETECTION (ALS/TLS), Artur Janowski, Piotr Nierebinski, Jakub Szulwic, Politechnika Gdanska Wydzial Inzynierii Ladowej i Srodowiska, Poland .................................................................995


129. COHERENT AND NONCOHERENT ANALYSIS OF THE MULTITEMPORAL C-BAND SAR DATA FOR AGRICULTURAL CHANGE MONITORING, PhD Eng. Violeta Poenaru, Prof. Alexandru Badea, Prof. Sorin Mihai Cimpeanu, PhD. Stud. Cristian Moise, Romanian Space Agency, Romania .................1011

130. DENSE POINT CLOUDS AS A DATA SOURCE OF ORTHOIMAGES, Wojciech Ostrowski, Warsaw University of Technology, Poland .................................................................1019

131. DEVELOPMENT OF SUBURBANIZATION IN THE HINTERLAND OF PRAGUE MONITORED BY REMOTE SENSING, Ph.D. Daniel Franke, Czech University of Life Sciences - Prague, Czech Republic .................................................................1027


133. DIRECT GOREFERENCING APPLICATION OF AERIAL PHOTOGRAMMETRY USING A GNSS/IMU SENSOR SYSTEM, Assoc. Prof. Dr. Eng. Gabriel Popescu, Lecturer Dr. Eng. Octavian Laurentiu Balota, Lecturer Dr. Eng. Daniela Iordan, University of Agronomic Science and Veterinary Medicine - Bucharest, Romania .................................................................1043

134. EVALUATION OF THE DEVELOPMENT AGRICULTURAL PLANTS FOR PRECISION FARMING BASED ON REMOTE SENSING METHODS, Dr. Jakub Mirijovsky, dr. Jan Brus, MSc. Jitka Dolezalova, Svatopluk Mistecky, Palacky University in Olomouc, Czech Republic .................................................................1051

135. EXCLUSION OF NON-COHERENT AREAS FROM THE INTERFEROMETRIC SAR ANALYSIS USING COHERENCE MASKS, MSc. Huber Malik, Prof. Andrzej Lesniak, AGH - University of Science and Technology, Poland .................................................................1059

137. GROUND DEFORMATIONS MONITORING WITHIN RURAL AREAS USING SATELLITE RADAR INTERFEROMETRY METHOD, Assoc. Prof. Stanisława Porzycka-Strzelczyk, Hubert Malik, Jacek Strzelczyk, AGH University of Science and Technology, Poland .......................................................... 1075

138. GROUND DISPLACEMENT DETECTION AND MONITORING USING SYNTHETIC APERTURE RADAR IMAGERY, Iulia Dana Negula, Violeta Poenaru, Romanian Space Agency, Romania .......................................................... 1083

139. IMAGE CORRELATION AS A TOOLL FOR TRACKING FACIAL CHANGES CAUSING BY EXTERNAL STIMULI, Katarzyna Bobkowska, Artur Janowski, Marek Przyborski, Gdansk University of Technology, Poland ......................... 1089

140. IMPACT OF POINT IDENTIFICATION DURING STEREOPHOTOGRAMMETRIC EVALUATION OF FOREST ENVIRONMENT, Julian Tomastik, Frantisek Chudy, Miroslav Kardos, Daniel Tunak, Technical University in Zvolen, Slovakia .......................................................... 1097

141. LIGHTWEIGHT FISHEYE CAMERAS IN PHOTOGRAMMETRY, Wojciech Ostrowski, Warsaw University of Technology, Poland ........................................ 1105


143. POMPEII: MULTI-SCALAR MULTI-SENSOR nD SURVEYING, Carmine Gambardella, Nicola Pisacane, Alessandra Avella, Pasquale Argenziano, Carmine Maffei, Second University of Naples Department of Architecture and Industrial Design, Italy .......................................................... 1119

144. SELECTION OF OPTIMAL STRATEGY FOR DSM GENERATION FROM MULTI-VIEW DENSE IMAGE MATCHING, Wojciech Dominik, Warsaw University of Technology - Faculty of Geodesy and Cartography, Poland ........................................ 1127

145. TESTING RPAS FOR CADASTRE PURPOSES, Eliska Housarova, Prof. Dr. Ing. Karel Pavelka, Ing. Jaroslav Sedina, CTU in Prague, Czech Republic ........................................ 1135


xiv
147. POSSIBILITY OF USING REMOTE SENSING FOR OVERFLOW LAND DUE TO MINING ACTIVITIES IN UPPER SILESIAN COAL BASIN, Msc Karol Kura, Central Mining Institute (GIG), Poland ................................................................. 1151

148. THE COMBINATION OF GEODETIC AND CLOSE-RANGE PHOTOGRAMMETRY METHODS IN TERRAIN MAPPING FOR THE PURPOSE OF HYDROLOGICAL ANALYSIS IN LAND EROSION PROTECTION, Marcel Kliment, Jakub Kocica, Tomas Kliment, Michaela Bulikova, Jozef Halva, Slovak Agriculture University in Nitra, Slovakia ................. 1159

149. THE COMPARISON OF STANDARD METHODS FOR PAVEMENT TEXTURE EVALUATION WITH UNCONVENTIONAL APPROACH USING 3D SCANNING, Ing. Peter Kotek, Assoc. Prof. Matus Kovac, Prof. Martin Decky, University of Zilina - Faculty of Civil Engineering - Department of Highway engineering, Slovakia ......................................................................................................................... 1167

150. THE METHOD OF MEASURING THE MEMBRANE COVER GEOMETRY USING LASER SCANNING AND SYNCHRONOUS PHOTOGRAMMETRY, Artur Janowski, Waldemar Kaminski, Karolina Makowska, Jakub Szulwic, Krzysztof Wilde, Politechnika Gdanska Wydzial Inzynierii Ladowej i Srodowiska, Poland ................................................................. 1175


152. THE USE OF MORPHOLOGICAL FILTERS AND GRANULOMETRIC METHOD TO ANALYZE THE MOVEMENT OF THE MOLECULES IN THE SEA WATER OF THE SOUTHERN BALTIC SEA, Jakub Szulwic, Marcin Serafin, Artur Janowski, Marek Przyborski, Gdansk University of Technology, Poland ...... 1195

153. THE USE OF TERRESTRIAL LASER SCANNING FOR MEASUREMENTS IN SHALLOW-WATER: CORRECTION OF THE 3D COORDINATES OF THE POINT CLOUD, Prof. Greta Deruyter, Prof. Marc Vanhaelst, Dr. Cornelis Stal, MSc. Hanne Glas, Prof. Alain De Wulf, Ghent University, Belgium ................................................................................................................................. 1203

154. TOWARDS COST-EFFICIENT PROSPECTION AND 3D VISUALIZATION OF UNDERWATER STRUCTURES USING COMPACT ROVS, Dr. Cornelis Stal, Prof. dr. ing. Greta Deruyter, Dr. Mieke Paelinck, MSc. Annelies Vandenbulcke, Prof. dr. ir. Alain De Wulf, Ghent University, Belgium ...... 1211

155. VERIFICATION OF REMOTE SENSING DATA FOR MEASURING BATHYMETRY ON SMALL WATER RESERVOIRS, Vaclav Hradilek, Petr Basta, Stepan Vizina, Petr Maca, Pavel Pech, Czech University of Life Sciences - Prague, Czech Republic ................................................................................................................................. 1219
SECTION GEOMATIC
MINERAL AND ANTHROGHENE ACCESS DATABASES ORGANIZATION FOR ALSHAR POLYMETALLIC DEPOSIT AND WASTE DUMP, REPUBLIC OF MACEDONIA

M. Sc. Dalibor Serafimovski¹
Full. Prof. Dr. Vlado Gičev¹
Full Prof. Dr. Kosta Mitreski²
¹ Faculty of Computer Science, University “Goce Delčev”- Štip, R. Macedonia
² Faculty of Computer Science and Engineering, University ”Ss.Cyril and Methodius” Skopje, R. Macedonia

ABSTRACT
The Republic of Macedonia has an extensive mining past and presence, related to several polymetallic mineral deposits, which is important for its economy. This paper focuses on efforts we made to organize Microsoft Access database with the most representative data for the across the World well known Alshar polymetallic deposit in the Republic of Macedonia. At the very beginning, with the software package “Microsoft Access” we have organized database with information of the most important geological, metallogenic and economic features of the deposit. Also, we have not omitted the fact that, although limited, mine exploitation has been followed with production of significant anthropogenic input to the environment, so we have structured and anthropogenic database too. Both databases were adapted for simple and sophisticated querying of particular deposit and anthropogenic features and allows edition of reports and a geographic display of the queried information.

Keywords: Au-Ag-As-Sb-Tl deposit, Access database, reserves, anthropogenic input, economy

INTRODUCTION
At the territory of the Republic of Macedonia there are several polymetallic deposits that has been exploited during several last decades. Mainly those were lead-zinc, copper and nickel deposits, followed by some other deposits of smaller economic significance. Here we would like to give an accent to the old mine with former underground operations Alshar, which ceased its activities in 1965. The Alsar area is characterized by increased concentrations of arsenic, antimony and thallium. Increased arsenic and thallium concentrations have also been found in some plants such as Thimus and Viola [1], [2]. It can generally be said that the Alsar deposit contains about 500 000 tones of antimony ore (with 2.50 Sb) and about 1.50% As. Increased concentrations of thallium of 0.2% Tl (or some 40 tones of thallium ore) have also been determined.
The problem with environmental pollution around the Alshar mine has been generally related to several open adit waste dumps, whose contaminated water drained directly into Madenska River, which at particular places passes through or by open adit waste dumps where continuous decay of arsenic minerals (realgar, auripigment etc.) pollutes fresh waters with As, Sb, Hg, Tl etc. It is of note that earlier mining waste dumps with large amounts of waste material that resulted from mining activities have been found in the riverbed of Majdanska. Increased concentrations of trace elements have been
determined in the material and in the river sediments. To be honest, up to date, in the Republic of Macedonia there weren’t professional databases that should be in accordance to the European directives, although there is an initiative in ours Ministry of Economy that such database(s) should be prepared and included in similar modern European databases (ex. Mineral database at the BRGM, France).

We were aiming to organize both databases with an information about some of the most representative Alshar deposit features, regarding natural and anthropogenic issues. Bearing in mind that the Alshar deposit and former mine have a long history of exploration and exploitation, we knew that building aforementioned databases is not an easy task to fulfill. We had to systematize data from exploration longer than seven decades and exploitation longer than half a century. Also, we were aware of the problem with environmental pollution around the Alshar deposit and former mine adits, which in general is related to waste water outflow to River Majdanska, which empties into Blasnica and later the water flows into Lake Tikvesh, where increased arsenic, antimony and thallium concentrations are a risk for the human environment. Organization of the both Access databases was carried out under several main topics, which are in accordance with the GIS related mineral databases principles given elsewhere [1], [2], [3], [4], [5], [6], [7], [8], [9].

DISCUSSION

The particular mineral database itself was structured under the following main topics:

**General information** where has been enclosed information about the mining company, status, latitude/longitude, ore district name, comments etc. (Figure 1).

![Fig. 1. General information datasheet of the database](image)

For example on our sample of the Alshar deposit gave an accent that it is a former mine and prospective deposit with certain potentials in regards to gold, thallium, antimony, arsenic and silver. That information was followed by detailed coordinates and name of the company owner of the mine and production facility, as well as familiar names used by locals for the mine and short general comments.
**Deposit features** sheet is organized in a manner that should be given details about the parameters: deposit type, main morphology and secondary morphology (Figure 2).

On our example deposit, Alshar, we have entered data about the deposit’s combined type where we have pointed out the Carlin-type sediment-hosted vein and disseminated replacement with elements of atypical epithermal deposit type morphology.

![Fig. 2. Deposit features datasheet of the database](image)

**Mineralization/Rocks** data sheet usually should contain data about age (supposed and absolute), ore mineralogy, gangue mineralogy, hydrothermal alteration, host rock (age supposed/absolute, host rock formation, name and lithology). All of them being grouped into separate main windows (Figure 3).

![Fig. 3. Mineralization-rocks information datasheet of the database](image)

Here we have entered a significant amount of data regarding the mineralization age (relative 5.3-1.8 Ma; absolute 5.3), ore mineralogy (arsenopyrite, cinnabar, marcasite, gold, orpiment, stibnite, etc.), gangue mineralogy (barite, chalcedony, calcite, quartz etc.)
and diverse hydrothermal alterations (scarification, silicification, sulfidation, kaolinization etc.). After that followed an information about the host rock age (relative 5.6–4.1 Ma; absolute 5.5, K/Ar method) and host rock lithology (schist, marble, limestone, dolomite, tuff etc.).

**Economy** data sheet was planned to provide an information about ore type, grade unit, former production, average grade of production, years of exploitation, reserves, average grade, type of reserves, resources, average grade of resources, type of resources organized in windows named exploitation type, main commodity and commodity (Figure 4).

![Economy information datasheet of the database](image)

**Fig. 4.** Economy information datasheet of the database

So, here for the Alshar deposit, we gave an about the the fact that it mainly unworked deposit where the main commodities are represented gold, silver, thallium, antimony, arsenic etc. Also, reserves has been quoted as proved mineral reserves of 20 000 000 t (gold concentration of 2 g/t Au) as well as indicated reserves of four additional commodities (Ag, Tl, Sb, As) given as separate records within this datasheet (metal production, not the raw ore).

**High-Tech Metals** information sheet was divided into two different windows, which have been established in order to characterize (i) Potential of specific commodities or capacities (ii) where the anthropogenic products are processed. To characterize High-Tech metals, user has to enter a commodity (ex. Re, Se, Ga…), and then he will be able to give information about host minerals (e.g. molybdenite), grades (i.e. minimum, maximum and average grade) and abundance of host minerals in the ore. The right window give information about processing site(s) (e.g. concentrator, mill, smelter…). Due to relatively strong unworked nature of the deposit, we haven’t entered any additional data regarding this information sheet of the database.

**Comments** sheet, which is composed of two windows where it is possible to write free texts describing details about geology and/or details about economy of a particular deposit gives a fine opportunity to describe particular deposit in more details (Figure 5). Here we have entered extensive free text data about the detailed geological and mineralization features of the deposit, not mentioned elsewhere in the database (Figure 5).
In the lower window intended for data about the economy we have pointed out that the Alsar deposit was mined, intermittently, from about 1880 to 1912 for its arsenic ore, when the first discoveries of of TI-minerals (lorandite, vrbaite) took place, as well as the later exploration for antimony from 1958 until 1965. Also, we accentuated that gold mineralization of probably economic importance has been identified as well as the special interest for thallium as possible solar neutrino detector.

*Iconography* sheet has been elaborated in order to attach images with a deposit (Figure 6).

The first step being definition of paths of the image directory and the image viewer (e.g. Photo Editor, Windows picture viewer, Picasa...) by clicking on “Configuration” button (Figure 6).

*Bibliography* data sheet for a particular deposits was intended to give an overview of geological bibliography (references relating to the geology of the deposit) and economical bibliography (references relating to economic data of the deposit) as can be seen at Figure 7.
For the Alshar deposit, we made significant input in regards to both types of bibliography, geological and economical ones. All the known and commonly used references to this particular deposit has been covered in this data sheet.

In regards to the anthropogenic concentrations Access database we would like to display its several organizational entities:

**General information** address information about the location, status, latitude/longitude, ore district name, comments etc. (Figure 8).

For the Alshar deposit related anthropogenic concentrations, we stressed out that is a former facility with description of implemented processing methods, followed by coordinates, familiar names used by locals for the mine and short general comments.

**Wastes and products** sheet is organized in a manner that should be given details about the parameters: type of storage (surface, underground) type of waste (mine waste dump, slag,...) volume and surface occupied as well as tonnage and density of a particular waste-product, waste mineralogy, particular commodity and affected water area (Figure
9). Here potential of specific commodities in the anthropogenic products (e.g. Sb, As, Tl, Au ...) related to certain host minerals was given, as well as grades (i.e. minimum, maximum and average grade) and abundance of host minerals in anthropogenic products. For ours particular locality, Alshar, we have entered data about all different kinds of Sb-As-Tl-Au minerals (stibnite, realgar, orpiment, lorandite, vrbaite, ragunite etc.). There the accent was given to the significant quantities of antimony, arsenic, thallium and gold with potential of 9886 tons for antimony and arsenic individually, 2471 tons for thallium and 2 tons of gold potential.

Fig. 9. Wastes and products datashet of the anthropogenic database

Comments sheet, which is composed of space where it is possible to write free texts describing details about geology and/or details about economy of a particular deposit related to the anthropogenic concentrations gives a fine opportunity to describe particular concentrations in more details (Figure 10). For example for our location, anthropogenic concentrations, around the Alshar deposit, we have entered detailed, up to date findings, about the type, size, geology and geological setting of the deposit related to the anthropogenic concentrations, details about the mining history of the locality (since 1881 and lasted with interruptions until 1965) with their representative eventual economic features as well as many other features such are past annual mine capacity, quantitative-qualitative parameters of produced ore, facility (facilities) where the raw excavated ore has been processed etc (Figure 10).

Fig. 10. Comments information datasheet of the anthropogenic database

Iconography sheet has been elaborated in order to attach images with an anthropogenic concentration. The first step being definition of paths of the image directory and the image
viewer (e.g. Photo Editor, Windows picture viewer, Picasa...) by clicking on “Configuration” button quite similar to the mineral database above (Figure 6).

**Bibliography** data sheet for particular anthropogenic concentrations was intended to give an overview of available bibliography (references relating to the anthropogenic concentrations) and economical bibliography (references relating to economic data of the anthropogenic concentrations) and organizationally was quite similar to the previous database seen at Figure 7.

**CONCLUSION**

The initial build of the Access database for the Alshar mineral deposit and its anthropogenic reflections, had their major accents in the qualitative-quantitative parameters and natural indicators in function to present and future valorization of metals that were subject to the establishment of the database, in accordance with professional mineral databases, as well as environmental and economic viability of the particular waste dump enclosed in form of an anthropogenic concentration Access database.

**REFERENCES**


