

25th International Multidisciplinary Scientific GeoConference (SGEM 2025)

Geoinformatics, Remote Sensing, and
Artificial Intelligence (AI)

SGEM International Multidisciplinary Scientific GeoConference
Volume 25, Issue 2.1

Albena, Bulgaria
29 June - 6 July 2025

Editors:

**Baiba Rivza
Ildiko Tulbure
Oleksandr Trofymchuk**

ISBN: 979-8-3313-2891-7

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2025) by SGEM WORLD SCIENCE (SWS) Scholarly Society
All rights reserved.

Printed with permission by Curran Associates, Inc. (2025)

For permission requests, please contact SGEM WORLD SCIENCE (SWS) Scholarly Society
at the address below.

SGEM WORLD SCIENCE (SWS) Scholarly Society
10/11 Gerlgasse
Vienna 1030, Austria

Phone: +359 2 405 18 41

Fax: +359 2 405 18 65

sgem@sgem.org

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
Email: curran@proceedings.com
Web: www.proceedings.com

CONFERENCE PROCEEDINGS CONTENTS

GEOINFORMATICS, GEODESY, AND AI APPLICATIONS IN SPATIAL SCIENCES

1. **ASSESSING THE ROBUSTNESS OF FACIAL CLASSIFICATION METHODS IN THE BIOMETRIC IDENTIFICATION AREA**, Dr. Marek Hütter, Dr. Věra Holubová, Assoc. Prof. Dr. Radomír Ščurek, Ing. Jaroslav Lukaščík3
2. **DATA COLLECTION METHODOLOGY FOR ARTIFICIAL INTELLIGENCE MODELS IN SOCIALLY RELEVANT AREAS**, Assoc. Prof. Dr. Kristina Dineva, Prof. Dr. Tatiana Atanasova, Kalin Kopanov 13
3. **ANALYSIS OF DATA FRAGMENTATION IN ARTIFICIAL INTELLIGENCE MODELS TO IMPROVE DECISION-MAKING PROCESSES IN SOCIALLY SIGNIFICANT AREAS**, Assoc. Prof. Dr. Kristina Dineva, Prof. Dr. Tatiana Atanasova, Velizar Varbanov 19
4. **FAMILIARITY OF THE UNIVERSITY STUDENTS OF LANDSCAPE ENGINEERING WITH LARGE LANGUAGE MODELS**, Assoc. Prof. Elena Aydın, MSc. Deniz Aydın25
5. **HYBRID DETERMINISTIC AND MACHINE LEARNING APPROACH FOR SOLAR POWER FORECASTING WITH UNCERTAINTY ESTIMATION**, Juris Seņņikovs, Dr. Staņislavs Gendelis, Andrejs Timuhins, Dr. Uldis Bethers33
6. **MAPPING RENEWABLE ENERGY POTENTIAL: ASSESSING THE FEASIBILITY OF WIND-SOLAR POWERED AUTONOMOUS INFRASTRUCTURE IN LATVIA**, Juris Seņņikovs, Dr. Staņislavs Gendelis, Pēteris Bethers, Jēkabs Priedītis, Kirills Bobkovs, Fjodors Čaplinskis41
7. **ROLES OF ARTIFICIAL INTELLIGENCE IN PREDICTIVE AGROECOLOGICAL MODELING AND SUSTAINABLE LAND MANAGEMENT IN RESPONSE TO CLIMATE VARIABILITY IN THE MOSCOW REGION**, Emmanuel Igwe, Jeremiah Akomaye Ikwen, Shaibu Ochoche, Aloye Racheal Aniah, Joseph Ikwun Agiopu Ogar.....49
8. **THE PILOT STUDY OF B-MODE IMAGE ANALYSIS OF KIDNEY DISEASES**, Jiří Blahuta, Lukáš Pavlík, Tomáš Soukup, Jiří Kozel57
9. **HOW DOES THE DATUM POINT LOCATION AFFECT THE ACCURACY OF THE ADJUSTED BENCHMARK HEIGHTS IN A PRECISE LEVELING NETWORK?**, Assoc. Prof. Dr. Vasil Cvetkov, Assoc. Prof. Dr. Christina Mickrenska65

10. AN ADJUSTMENT OF PRECISE LEVELLING NETWORK BY ERROR FACTOR ASSUMPTION-FREE WEIGHTS , Assoc. Prof. Dr. Christina Mickrenska, Chief Assist. Prof. Dr. Vasil Cvetkov	73
11. DIGITAL COMMON DATA ENVIRONMENT PLATFORM AS AN IMPLEMENTED TOOL FOR THE MANAGEMENT OF AN OPERATIONAL BUILDING , Eng. Karolina Drozdowska, PhD. Eng. Aleksandra Radziejowska.....	81
12. MONITORING DEFORMATION IN DEEP SALT MINES: A HIGH-PRECISION APPROACH TO CONVERGENCE MEASUREMENT AT KŁODAWA SALT MINE , Jakub Pietras, Agnieszka Malinowska	91
13. POSSIBLE RISKS OF GNSS MEASUREMENTS NEAR POWER LINES , PhD Petr Jadviščok, Assoc. Prof. Roman Kapica, Assoc. Prof. Pavel Černota.	101
14. TIDAL VARIATIONS OF SEA LEVEL AT VARNA TIDE GAUGE , Dr. Anton Ivanov, Prof. Dr. Nikolay Dimitrov	109

REMOTE SENSING, PHOTOGRAMMETRY, AND GEOSPATIAL MODELING

15. CHANGES IN THE SPATIAL DISTRIBUTION OF VEGETATION COVER CLASSES IN UKRAINE BASED ON TEMPORAL DATA FROM SPACE SURVEY UNDER MODERN CLIMATE CONDITIONS , PhD Lesya Yelistratova, Igor Onopchuk, PhD Alexander Apostolov, Yulia Zakharchuk	119
16. COMPREHENSIVE GROUND-SPACE MONITORING OF GEODYNAMIC PROCESSES AT THE MIRGALIMSAY DEPOSIT , Head of laboratory Aminyam Baltiyeva, PhD Elmira Orynbasarova, PhD Zhanar Bimurat, PhD Ress. Gulmira Makhmetova	127
17. DIGITAL APPROACHES IN COASTAL GEOARCHAEOLOGICAL INVESTIGATION ALONG THE BULGARIAN BLACK SEA COAST , Assoc. Prof. Dr. Preslav Peev	137
18. INVESTIGATION OF SHIP FREE OSCILLATION USING INERTIAL MEASURING UNIT SYSTEMS IN WATER AND AIR ENVIRONMENT , PhD George Cotoc, Prof. Dr. Liliana Rusu, Assoc Prof. Dr. Florin Pacuraru.....	145
19. MONITORING STABILITY IN THE VITOSHA FAULT AREA USING SATELITE DATA , Prof. Dr. Mila Atanasova-Zlatareva, Prof. Dr. Nikolay Dimitrov	153

20. SHORELINE DYNAMICS AND EVOLUTION OF SANDY BEACHES ALONG THE BURGAS COAST DURING THE PERIOD OF 1980S TO 2025, Nadezhda Dimitrova, Martin Ivanov, Assoc. Prof. Dr. Ahinora Baltakova, Naylyan Salieva, Lyubomir Rasovski.....	163
21. UAS-BASED MONITORING AND MULTI-TEMPORAL ANALYSIS OF SHORELINE DYNAMICS IN THE KAVATSITE BEACH SECTOR (1980S–2025), SOUTHERN BULGARIAN BLACK SEA COAST, PhD Res. Naylyan Salieva	179
22. USE OF SATELLITE IMAGES IN MONITORING PROCESSES, PhD Roxana Claudia Herbei, PhD Simona Cucaila, Assoc. Prof. Dr. Mihai Valentin Herbei, Assoc. Prof. Dr. Adrian Smuleac, Cosmin Dragomi	191
23. USING THE HARVESTLAB TECHNOLOGY FOR A VARIABLE APPLICATION OF DIGESTATE FROM THE BIOGAS PLANT – FIRST OPERATIONAL EXPERIENCES IN TERMS OF ITS INFLUENCE ON THE YIELD OF <i>ZEA MAYS L</i>, Ph.D. Jakub Elbl, Ph.D. Antonín Kintl, Assoc. Prof. Vojtěch Lukas, M.Sc. Jaroslav Pinkas, M.Sc. Igor Huňady	199
24. EVALUATING AUGMENTED REALITY MAPS: A USER-CENTERED THEORETICAL FRAMEWORK, Iva Cibilić, mag. ing. geod. et geoinf., Assoc. Prof. Dr. Vesna Poslončec-Petrić	207
25. HOW AUTONOMOUS ROBOTS AND INDOOR MAPPING IMPROVE WAREHOUSE SAFETY, Aleksandr Kochnev	215
26. STUDY OF THE USE OF TOPOGRAPHIC AND GEODETIC METHODS FOR THE IMPLEMENTATION OF A MUNICIPAL CADASTRE INFORMATION SYSTEM. CASE STUDY: GHEORGHENI NEIGHBORHOOD, CLUJ NAPOCA MUNICIPALITY, Assoc. Prof. Dr. Mircea Vasile Bondrea, PhD Raluca Bianca Bondrea, Assoc. Prof. Dr. Sanda Marioara Naş, Assoc. Prof. Dr. Raluca Claudia Galgau	223
27. USE OF GEOMATIC TECHNOLOGIES IN LAND SURFACE ANALYSIS - CASE STUDY A.T.U. BARZAVA, ARAD COUNTY, Prof. Dr. Cosmin Alin Popescu, Assoc. Prof. Dr. Mihai Valentin Herbei, Prof. Dr. Adina Horablagă, Dr. Codruta Badaluta Minda, Prof. Dr. Florin Sala.....	233