EWG-ORSDCE

NEWSLETTER OF EWG ORSDCE
DECEMBER 2021

ORSDCE - The OR in Sustainable Development and Civil Engineering Working Group of EURO
https://www.euro-online.org/websites/orsdce/

Content of the issue

Words of chairman

Dear Members of EWG-ORSDCE, dear Friends,

This issue of newsletter presents this year news, achievements and forthcoming events.

The active members of EWG-ORSDCE published several successful Special Issues in different Clarivate Analytics Web of Science journals and currently, some more issues open for submissions in journals related to the research field of our Working Group presented in this newsletter.

Please visit EWG-ORSDCE website https://www.euro-online.org/websites/orsdce/ register or update your personal information on members' portal.

As usual, we invite you to submit the papers to the journals published by the active members of EWG-ORSDCE: *Technological and Economic Development of Economy*, *Journal of Civil Engineering and Management*, *Journal of Business Economics and Management*, *International Journal of Strategic Property Management*, and *Engineering Structures and Technologies*.

Congratulations on all your achievements and best wishes for future activities.

With my best wishes, yours sincerely,
Edmundas Kazimieras Zavadskas, Chair of EWG-ORSDCE

Forthcoming events

© EURO 2022 | 32nd EURO Conference in Aalto University | Espoo, Finland 3–6 July 2022 | https://euro2022espoo.com/ | euro2022@abbey.ie

EURO 2022 is the largest and most important conference for Operational Research and Management Science (OR/MS) in Europe organized by EURO – the European Association of Operational Research Society and the Finnish Operations Research Society (FORS).

The conference will be held at the Aalto University, Espoo, Finland. Aalto University, founded in the merger of three universities in 2010, has long traditions in operations research and management science; indeed, EURO XII was organized in Helsinki in 1992.

Researchers, academics, practitioners, and students interested in any branch of Operational Research, mathematical modelling or economic analysis are invited to submit abstracts or organize sessions.

Invited and contributed papers will be organized in parallel sessions. In general, sessions are part of the Conference streams, and streams are grouped in different areas:

- Behavioral OR and Problem Structuring
- Continuous optimization
- Data Science and Analytics
- Decision support
- Discrete optimization algorithms
- Economics and game theory
- Financial modeling and risk management
- Foundations and history of OR
- Humanitarian and healthcare applications
- Interface of OR with other disciplines
- Logistics, Production and Revenue management
- OR and Sustainability
- OR Education and Development
- Practice of OR (Making an Impact)
- Queueing and Stochastics
- WISDOM - Women in Society Doing OR and MS

Abstracts must be written in English and contain no more than 1500 characters (no formulas or mathematical notation are allowed). Each attendee is allowed to present one paper at the conference.
Please note that the submission must be done by the person who will present the paper and will be shown as first author. No change to the first speaker will be allowed later.

Key dates & deadlines

Abstracts:

Abstract submission opens:	Friday, 29 October 2021
Abstract Submission Deadline:	Friday, 04 March 2022
Notification of Abstract Acceptance:	TBC

Registration:

Registration opens:	Friday, 26 November 2021
Early Registration Deadline:	Friday, 25 March 2022
Author Registration Deadline:	Friday, 08 April 2022

Registration information

Regular Registration Fees:

Early Registration	€385.00
Late Registration	€513.00
Low Income Countries	€187.50

Student/Retired Registration Fees:

Early Registration	€210.00
Late Registration	€280.00

Registration Fees Include:

* Admission to all sessions and the exhibition
* Conference materials (printed conference handbook with short programme; online access to a complete programme with abstracts; sponsor & exhibitor materials)
* Tea, coffee and lunches throughout the conference – Buffet lunch is included in the conference fee and served in three campus restaurants from 11 am to 3 pm. These three restaurants have seats for over 1,000 persons. Coffee is served twice a day at 3-4 different locations
* Admission to the Welcome Reception on Sunday evening and the Farewell Get Together on Wednesday evening.
* A four-day pass (Sunday-Wednesday) for public transportation including buses, trams, metro, commuter trains, and Suomenlinna ferry on zones A, B, and C covering Helsinki city center, Aalto Campus, and the airport

The registration fee for an accompanying person covers the same except the admission to sessions and conference materials. The cost for an accompanying person to attend is €129.00

Please note that the Conference Dinner on Tuesday is not included in the registration fee. The cost to attend the Conference Dinner is €100.00 and can be booked as part of the registration process.

Low to Middle income countries

Delegates selecting the Low to Middle income country registration type on the registration form must be from one of the LMIC countries below. In addition, delegates from other low income countries can apply for this lower registration fee by emailing EURO2022@abbey.ie

Venue

Aalto Campus: A compact, connected and modern conference venue

Aalto University is located about 6 km to the north-west of Helsinki city center. The new, modern metro connection opened in 2017 provides a quick and easy way to get to Aalto from central locations in Helsinki. There are over 5,000 hotel rooms along this metro line, with at most 14 min metro travel time to the campus. This is the only metro line in Helsinki, which makes traveling between the campus and the hotels very simple and easy.

Getting Around

About Helsinki & Espoo

Helsinki city center is very compact, which makes walking from one place to another always a good option. A brochure with four walking routes, in 11 languages, is available for free from the Tourist Information Centre at the Central Railway Station – exploring on foot is a great way to see Helsinki's sights! You can also stock up on regular printed maps and create your own route. The campus itself is also located along a popular walking route following the Espoo coastline.

Helsinki and Espoo have an excellent public transport system that is convenient and efficient. The registration fee includes a four-day pass (Sunday-Wednesday) for public transportation with which the delegates can use the metro, trams, buses, commuter trains, and Suomenlinna ferry. Trams are the main mode of public transport in the city centre and a great way to see the city.

City bikes offer an additional, easy option to get from Helsinki to Aalto Campus or – thanks to the extensive network of 476 bike stations – just to get around in the cities of Helsinki and Espoo.

EURO 2022 Conference Secretariat:

Abbey Conference & Events
City Gate
22 Bridge Street Lower
Dublin D08 DW30
Ireland

e: euro2022@abbey.ie
p: +353 1 6486 130

Please contact the conference secretariat regarding any queries you may have in relation to the congress registration or general information. Any queries on hotel bookings please contact the hotels directly.

MAIN MENU

- Home
- About conference
- Important dates
- Programme
- Conference Fees
- Publications
- Committee
- Accommodation
- Registration

WELCOME!

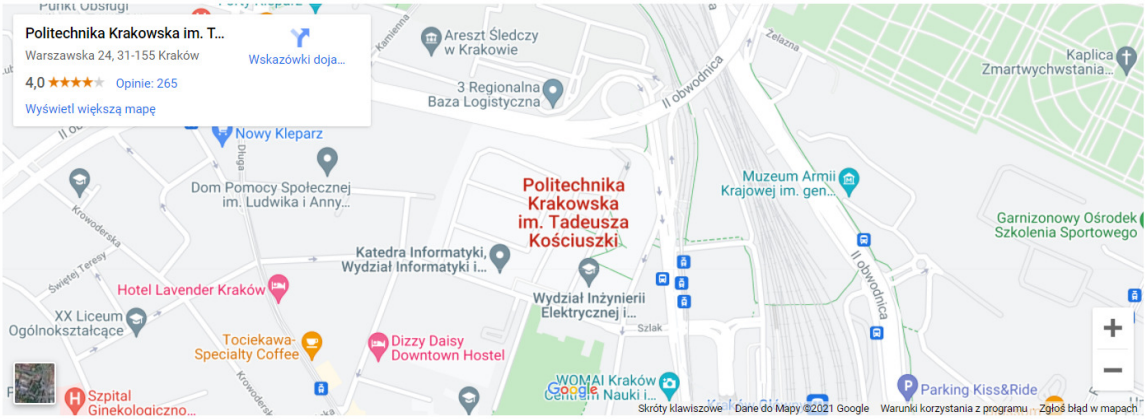
Welcome on webpage The 18th Colloquium "New Trends in Construction Management" and 8th meeting of EURO working group Operational Research in Sustainable Development and Civil Engineering

ORGANIZER

Cracow University of Technology
Faculty of Civil Engineering
Division of Management in Civil Engineering (L-7)
24 Warszawska Street, 31-155 Cracow

CONTACT

web page www.18ic.pk.edu.pl
e-mail 18IC@pk.edu.pl



ABOUT CONFERENCE

We are pleased to invite you to the joint meeting of researchers and practitioners active in the field of construction management: The 18th Colloquium "New Trends in Construction Management" and 8th meeting of EURO working group Operational Research in Sustainable Development and Civil Engineering.

Venue: Cracow University of Technology, Warszawska 24, Cracow, POLAND

Date: May, 19 – 20, 2022

General aims of the conference and workshop:

- the inspiration of young researchers to work,
- discussion and development of new ideas and solutions with partners from industry,
- presentation of innovative projects,
- knowledge bridge creation between academia-industry – PhD students,
- verification of the concepts in practice - case studies in progress

Topics

sustainable development in the built environment; operational research; decision making; civil engineering; construction technology and management; flexible management; lean management; building information modelling (BIM); agile management; buildings life cycle; qualification of human resources; real estate management; project management; quality management.

IMPORTANT DATES

10.01.2022 – submission of the abstract

20.01.2022 – confirmation of the abstract acceptance

15.03.2022 – deadline for registration and submission of the paper

19.05.2022 – 20.05.2022 – 18th Colloquium

The full papers after the peer-review process will be published on the web site and in journal - Details will be announced.

CONFERENCE FEES

Registration fees are different depending on whether you register for the virtual event or the in-person event.

Virtual Conference fee is 20 €.

In-person Conference fee is about 100 €.

The conference fee depends on the number of registered people. If a large number of people attend the conference, the conference fee will be reduced.

PROGRAMME

19.05.2022

10:00 – 11:00	Registration of participants / Welcome coffee
11:00 – 13.00	Plenary session - Overview of international collaboration
13:00 – 14:00	Lunch
14:30 – 16:00	Session
16:00 – 16:30	Coffee break
16:30 – 18:30	Poster Session and Discussions
19:00	Dinner

20.05.2022

10:00 – 12:00	Tour of Cracow

COMMITTEE

Honorary Committee of Colloquium

- Prof. Oleg Kapliński (Poland)
- Prof. Friedel Peldschus (Germany)
- Prof. Edmundas Kazimieras Zavadskas (Lithuania)

International Programme Committee of Colloquium:

- E. Plebankiewicz (Poland) - Chairwoman
- A. Kaklauskas (Lithuania)
- J. Paslawski (Poland)
- V. Maliene (United Kingdom)
- A. Sobotka (Poland)
- J. Šelih (Slovenia)
- M. Yazdani (Spain)
- S. Hashemkhani Zolfani (Chile)
- R.M. Hosseini (Australia)
- Z. Turskis (Lithuania)
- L. Ustinovičius (Lithuania)
- J. Antuchevičienė (Lithuania)
- T. Vilutiene (Lithuania)
- J. Tamošaitienė (Lithuania)
- K. Zima (Poland)
- A. Leśniak (Poland)
- E. Radziszewska – Zielina (Poland)
- W. Drozd (Poland)

Organising committee

- D. Wieczorek - chairman of the organizing committee
- R. Kozik
- M. Juszczyk
- J. Malara
- S. Biel
- M. Górka
- P. Karcińska
- M. Kowalik
- E. Mitera-Kiełbasa

ACCOMMODATION

Cracow provides a wide array of accommodation opportunities:

Hotel Ibis Stare Miasto *** Check the offer

Hotel Old Time *** Check the offer

Hotel Lavender *** Check the offer

Hotel Puro **** Check the offer

Hotel Vienna House **** Check the offer

Registration Form

Registration form for the 18th International Colloquium.

Gender (*) ○ Male ○ Female

Name (*)

Last name (*)

E-mail (*)

Phone number

How should we contact you? (*) ☑ Email ☐ Phone

Participation (*) ○ in-person event ○ virtual event ○

Submit Reset

http://18ic.pk.edu.pl/index.php/registration

CONTACT

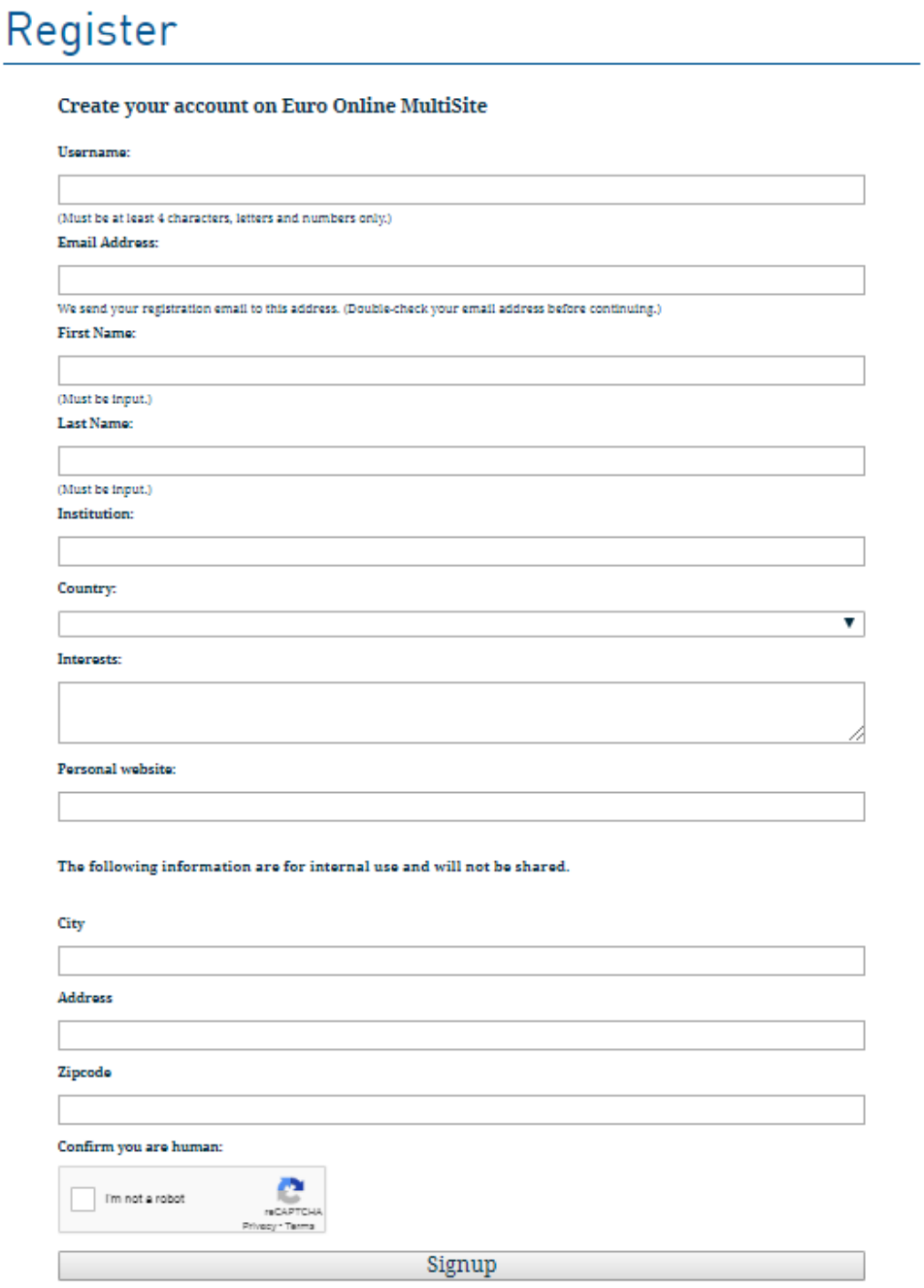
web page: www.18ic.pk.edu.pl

e-mail: 18IC@pk.edu.pl

The website for EWG ORSDCE

The website of EURO Working Group on Sustainable Development and Civil Engineering can be accessed using this link:
https://www.euro-online.org/websites/orsdce/

If you are a member of the working group, but your name is not yet on the list of members, please register here: https://www.euro-online.org/websites/orsdce/register/



To become a member of EURO Working group on Sustainable Development and Civil Engineering, please register and send the filled form to Coordinator. The form you can upload from the website.

Journal Special Issues aimed at optimization of processes in engineering and management

Edmundas Kazimieras Zavadskas, Jurgita Antuchevičienė, Tatjana Vilutienė, Audrius Banaitis

We are proud to announce that active members of EWG-ORSDCE published many successful Special Issues in different Clarivate Analytics Web of Science journals and currently some more issues are open for submissions in journals related to the research field of our Working Group.

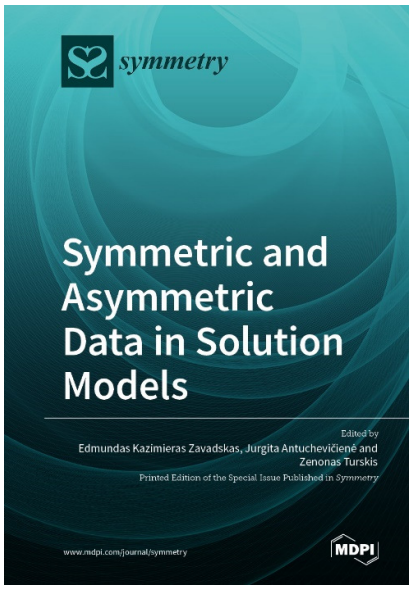
Special Issues published in 2021:

symmetry

- Special Issue ***"Symmetric and Asymmetric Data in Solution Models"*** in *"Symmetry"* journal (closed on 31 January 2021)

Guest Editors: Edmundas Kazimieras Zavadskas, Jurgita Antuchevičienė, Zenonas Turskis
https://www.mdpi.com/journal/symmetry/special_issues/Symmetric_Asymmetric_Data_Solution_Models

Printed Edition:



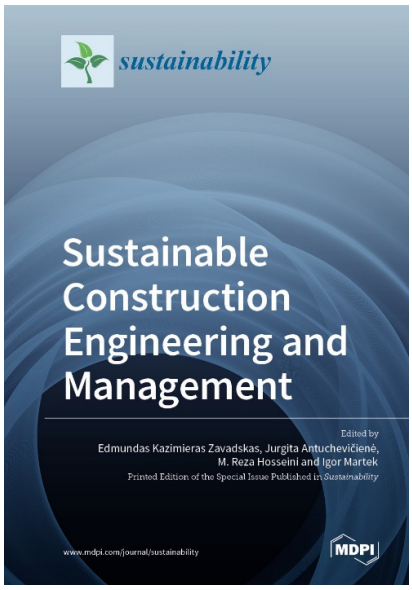
ISBN 978-3-0365-1612-7 (Hbk); ISBN 978-3-0365-1611-0 (PDF)
https://doi.org/10.3390/books978-3-0365-1611-0

sustainability

- Special Issue "***Sustainable Construction Engineering and Management"*** *in Journal „Sustainability*" (closed on 28 February 2021)

Guest Editors: Edmundas Kazimieras Zavadskas, Jurgita Antuchevičienė, Reza Hosseini, Igor Martek
https://www.mdpi.com/journal/sustainability/special_issues/construction_engineering

Printed Edition:



ISBN 978-3-0365-2628-7 (Hbk); ISBN 978-3-0365-2629-4 (PDF)
https://doi.org/10.3390/books978-3-0365-2629-4

- Special Issue "***Big data-driven large-scale group decision making under uncertainty (BiGDM-U)***" in Journal "Applied Intelligence" (closed on 30 April 2021)

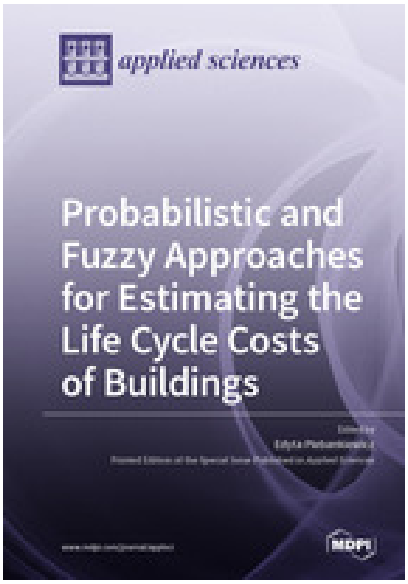
Guest Editors: Abbas Mardani, Edmundas Kazimieras Zavadskas, Hamido Fujita, Mario Köppen
https://link.springer.com/journal/10489/online-first

applied sciences

- Special Issue "***Probabilistic and Fuzzy Approaches for Estimating the Life Cycle Costs of Buildings***" in Journal "*Applied Sciences*" (closed on 20 August 2021)

Guest Editor: Edyta Plebankiewicz
https://www.mdpi.com/journal/applsci/special_issues/Life_Cycle_Cost_Buildings

Printed Edition:



ISBN 978-3-0365-2295-1 (Hbk); ISBN 978-3-0365-2296-8 (PDF)

https://doi.org/10.3390/books978-3-0365-2296-8

sustainability

- Special Issue "***Decision Support System and Sustainable Construction Management***" in Journal *"Sustainability"* (closed on 30 November 2021)

Guest Editors: Leonas Ustinovichius, Czeslaw Miedzialowski, Romuald Szelag
https://www.mdpi.com/journal/sustainability/special_issues/Decison_Support_System_Sus_Construction

sustainability

- Special Issue "***Sustainability and Risks in Construction Management***" in Journal *"Sustainability"* (closed on 31 January 2021)

Guest Editor: Jolanta Tamošaitienė

https://www.mdpi.com/journal/sustainability/special_issues/Sustainable_Risk_Assessment_Construction

- Special Issue "***Probabilistic Preference Theory and Applications in Management Sciences and Engineering*** " in "International Journal of Fuzzy Systems", Volume 23, issue 1, February 2021.

Guest Editors: Zeshui Xu, Janusz Kacprzyk, Edmundas Kazimieras Zavadskas, Dengfeng Li, Pankaj Gupta
https://link.springer.com/journal/40815/volumes-and-issues/23-1

energies

- Special Issue "***Innovations in Sustainable Architecture, Engineering and Construction***" in Journal "*Energies*" (closed on 30 November 2021)

Guest Editors: Audrius Banaitis, Chunlu Liu, Nerija Banaitiene
https://www.mdpi.com/journal/energies/special_issues/innovations_architecture

sustainability

- Special Issue "***Decision Support Systems and Multiple Criteria Decision Making for Sustainable Development***" in Journal *"Sustainability"* (closed on 31 March 2021)

Guest Editors: Artūras Kaklauskas, Ajith Abraham
https://www.mdpi.com/journal/sustainability/special_issues/dssmcdm_ma

sustainability

- Special Issue "***Sustainable Decision Making in Civil and Construction Engineering***" in Journal *"Sustainability"* (closed on 1 December 2021)

Guest Editor: Jolanta Tamošaitienė
https://www.mdpi.com/journal/sustainability/special_issues/Sustainable_Decision_Making

sustainability

- Special Issue "***Sustainable Design and Construction***" in Journal *"Sustainability"* (closed on 30 June 2021)

Guest Editor: Laura Tupėnaitė
https://www.mdpi.com/journal/sustainability/special_issues/SDC

TRANSPORT

- Special Issue "***Multiple Criteria Decision Making (MCDM) and Sustainability in Transportation Systems***" in Journal „Transport" (closed on 31 January 2020)

Guest Editors: Sarfaraz Hashemkhani Zolfani, Dragan Pamucar, Jurgita Antuchevičienė
https://journals.vgtu.lt/index.php/Transport/announcement/view/33

Open Special Issues:

mathematics

- Special Issue "***Multi-Criteria Decision Making and Data Mining***" in Journal *"Mathematics"* (Deadline for manuscript submissions: **30 December 2021**)

Guest Editors: James Liou, Artūras Kaklauskas
https://www.mdpi.com/journal/mathematics/special_issues/Multi_criteria_Decision_Making_Data_Mining

mathematics

- Special Issue "***Multiple Criteria Decision Making 2022***" in Journal *"Mathematics"* (Deadline for manuscript submissions: **30 December 2022**)

Guest Editors: Violeta Keršulienė, Zenonas Turskis
https://www.mdpi.com/journal/mathematics/special_issues/Multiple_Criteria_Decision_Making_2022

International Journal of *Environmental Research and Public Health*

- Special Issue "***Occupational Safety and Risks in Construction***" in Journal "*International Journal of Environmental Research and Public Health*" (Deadline for manuscript submissions: **31 August 2022**)

Guest Editors: Jolanta Tamošaitienė, Jerzy Pasławski
https://www.mdpi.com/journal/ijerph/special_issues/occupational_safety_risks

energies

- Special Issue "***Construction Project Management 2021***" in Journal "*Energies*" (Deadline for manuscript submissions: **20 March 2022**)

Guest Editors: Nerija Banaitiene, Audrius Banaitis, Chunlu Liu
https://www.mdpi.com/journal/energies/special_issues/construction_project_management_2021

sustainability

- Special Issue "***Analysis on Real-Estate Marketing and Sustainable Civil Engineering***" in Journal *"Sustainability"* (Deadline for manuscript submissions: **30 June 2022**)

Guest Editors: Natalija Lepkova, Laura Tupėnaitė
https://www.mdpi.com/journal/sustainability/special_issues/estate_marketing

energies

- Special Issue "***Sustainable Energy Technologies for Transition to Energy Positive Buildings***" in Journal "*Energies*" (Deadline for manuscript submissions: **31 December 2021**)

Guest Editors: Tatjana Vilutiene, Violeta Motuzienė
https://www.mdpi.com/journal/energies/special_issues/sustainable_energy_technologies_transition_energy_positive_buildings

buildings

- Special Issue "***Architecture: Integration of Art and Engineering***" in Journal "*Buildings*" (Deadline for manuscript submissions: **31 January 2022**)

Guest Editors: Oleg Kapliński, Agata Bonenberg, Wojciech Bonenberg, Marco Lucchini
https://www.mdpi.com/journal/buildings/special_issues/Artl_Engineering

sustainability

- Special Issue "***Architectural, Civil, and Infrastructure Engineering in View of Sustainability***" in Journal *"Sustainability"* (Deadline for manuscript submissions: **30 January 2022**)

Guest Editors: Oleg Kapliński, Lili Dong, Agata Bonenberg, Wojciech Bonenberg
https://www.mdpi.com/journal/sustainability/special_issues/View_of_Sustainability

sustainability

- Special Issue "***Design and Construction of Civil Engineering Structures Appropriate for Sustainable Development***" in Journal *"Sustainability"* (Deadline for manuscript submissions: **31 May 2022**)

Guest Editors: Agnieszka Leśniak, Krzysztof Zima
https://www.mdpi.com/journal/sustainability/special_issues/CivilEngineering

buildings

- Special Issue "***Construction Management – Future Innovations, Methods, Techniques and Technologies***" in Journal "*Buildings*" (Deadline for manuscript submissions: **31 December 2021**)

Guest Editors: Agnieszka Leśniak, Krzysztof Zima
https://www.mdpi.com/journal/buildings/special_issues/Construction_Management_Innovation_Methods_Technologies

buildings

- Special Issue "***Sustainable Supply Chain Management in Construction: Resilience, Flexibility, and Innovation***" in Journal "*Buildings*" (Deadline for manuscript submissions: **31 December 2022**)

Guest Editors: Audrius Banaitis, Anil Kumar, Serdar Durdyev
https://www.mdpi.com/journal/buildings/special_issues/sus_chain_construc

applied sciences

- Special Issue "***Fuzzy Logic and Fuzzy Hybrid Techniques for Construction Engineering***" in Journal "*Applied Sciences*" (Deadline for manuscript submissions: **22 April 2022**)

Guest Editor: Edyta Plebankiewicz
https://www.mdpi.com/journal/applsci/special_issues/fuzzy_logic_fuzzy_hybrid_techniques_construction_engineering

applied sciences

- Special Issue "***Big Data in Construction Engineering and Management***" in Journal "*Applied Sciences*" (Deadline for manuscript submissions: **10 January 2022**)

Guest Editors: Krzysztof Zima, Agnieszka Leśniak, María Dolores Andújar-Montoya, Ali Ghaffarian Hoseini
https://www.mdpi.com/journal/applsci/special_issues/BD_CEM

sustainability

- Special Issue "***Decision-Making Approaches to Support the Sustainability of Supply Chain System in Pandemic Disruptions***" in Journal *"Sustainability"* (Deadline for manuscript submissions: **28 February 2022**)

Guest Editors: Morteza Yazdani, Prasenjit Chaterjee, Ahmed Maher, Ernesto D.R. Santibanez-Gonzalez
https://www.mdpi.com/journal/sustainability/special_issues/decision_making_supply_chain

sustainability

- Special Issue "***Sustainable Enterprise Resources Planning Systems: Current Status, Challenges, and Future Directions***" in Journal *"Sustainability"* (Deadline for manuscript submissions: **30 July 2022**)

Guest Editors: Abdoulmohammad Gholamzadeh Chofreh, Feybi Ariani Goni, Abbas Mardani, Syuhaida Ismail
https://www.mdpi.com/journal/sustainability/special_issues/sustainable_enterprise

International Journal of *Environmental Research and Public Health*

- Special Issue "***Healthcare Circular Economy: Opportunities and Challenges***" in Journal "*International Journal of Environmental Research and Public Health*" (Deadline for manuscript submissions: **30 June 2022**)

Guest Editors: Abbas Mardani, Abdoulmohammad Gholamzadeh Chofreh, Syed Abdul Rehman Khan
https://www.mdpi.com/journal/ijerph/special_issues/Circul_Health

entropy

- Special Issue " ***Entropy for Machine Learning and Complex Systems Toward Regional Sustainable Development***" in Journal "*Entropy*" (Deadline for manuscript submissions: **15 April 2022**)

Guest Editors: Abbas Mardani, Edmundas Kazimieras Zavadskas, Dragan Pamucar, Fausto Cavallaro
https://www.mdpi.com/journal/entropy/special_issues/reg_sustain_dev

symmetry

- Special Issue "***Multi-Criteria Decision-Making Techniques for Improvement Sustainability Engineering Processes II***" in Journal "Symmetry" (Deadline for manuscript submissions: **31 December 2021**)

Guest Editors: Edmundas Kazimieras Zavadskas, Dragan Pamucar, Željko Stević, Abbas Mardani
https://www.mdpi.com/journal/symmetry/special_issues/Sustainability_assessment_globalization

energies

- Special Issue "***Uncertain Decision Making Methods in Energy Policies for Sustainable Development***" in Journal "*Energies*" (Deadline for manuscript submissions: **30 June 2022**)

Guest Editors: Abbas Mardani, Edmundas Kazimieras Zavadskas, Madjid Tavana, George Philippidis
https://www.mdpi.com/journal/energies/special_issues/Decision_Making_Energy_Policies

INTERNATIONAL JOURNAL of STRATEGIC PROPERTY MANAGEMENT

- Special Issue "***Modern Multiple Criteria Decision Making Methods in Property Management***" in Journal "*International Journal of Strategic Property Management*" (Deadline for manuscript submissions: **28 February 2022**)

Guest Editors: Huchang Liao, Saulius Raslanas, Abbas Mardani
https://journals.vgtu.lt/index.php/IJSPM/announcement/view/43

Computer Modeling in Engineering & Sciences

- Special Issue "***Linguistic Approaches for Multiple Criteria Decision Making and Applications***" in Journal "*CMES-Computer Modeling in Engineering & Sciences*" (Deadline for manuscript submissions: **31 December 2022**)

Guest Editors: Huchang Liao, Xingli Wu, Abbas Mardani, Zeshui Xu, Edmundas Kazimieras Zavadskas
https://www.techscience.com/CMES/special_detail/linguistic_approaches

algorithms

- Special Issue "***Multiple Criteria Decision Making Algorithms in Engineering and Management***" in Journal "*Algorithms*" (Deadline for manuscript submissions: **31 May 2022**)

Guest Editors: Edmundas Kazimieras Zavadskas, Zenonas Turskis, Jurgita Antuchevičienė

https://www.mdpi.com/journal/algorithms/special_issues/MCDM_algorithms

- Special Issue "***Sustainable Construction Engineering and Management: Enablers of Change, Part II***" in Journal *"Sustainability"* (Deadline for manuscript submissions: **31 May 2022**)

Guest Editors: Edmundas Kazimieras Zavadskas, Jurgita Antucheviciene, M. Reza Hosseini, Amirhosein Ghaffarianhoseini
https://www.mdpi.com/journal/sustainability/special_issues/construction_engineeringII

- Special Issue "***Moving towards Digitalization in Building Energy Modeling***" in Journal "*Energies*" (Deadline for manuscript submissions: **30 December 2021**)

Guest Editors: Serdar Durdyev, Saeed Reza Mohandes, David John Edwards, Edmundas Kazimieras Zavadskas
https://www.mdpi.com/journal/energies/special_issues/Digitalization_in_Building_Energy_Modeling

- Special Issue "***Automation and Robotics Application in Energy Systems***" in Journal "*Energies*" (Deadline for manuscript submissions: **30 December 2021**)

Guest Jarosław Konieczny
https://www.mdpi.com/journal/energies/special_issues/Automation_and_Robotics

- Special Issue "***Symmetric and Asymmetric Data in Solution Models, Part II***" in Journal "Symmetry" (Deadline for manuscript submissions: **31 January 2022**)

Guest Editors: Edmundas Kazimieras Zavadskas, Jurgita Antuchevičienė, Zenonas Turskis
https://www.mdpi.com/journal/symmetry/special_issues/Symmetric_Asymmetric_Data_Solution_Models_part_II

- Special Issue " ***Shaping the future of digital economy using business analytics models***" in Journal " Economic Research-Ekonomska Istraživanja" (Deadline for manuscript submissions: **30 June 2023**)

Guest Editors: Abbas Mardani, Edmundas Kazimieras Zavadskas, Reza Farzipoor Saen, Fausto Cavallaro

https://think.taylorandfrancis.com/special_issues/digital-economy-models/?utm_source=TFO&utm_medium=cms&utm_campaign=JPG15743

JOURNAL OF CIVIL ENGINEERING AND MANAGEMENT: A brief overview of the development of the Journal

Edmundas Kazimieras Zavadskas,
Artūras Kaklauskas,
Jurgita Antuchevičienė

We are sure that the Members of our Working Group are well aware of the *Journal of Civil Engineering and Management* (JCEM) that is closely related to the topics of their research. Nevertheless, this time we would like to present a brief overview of its development due to two important facts that happened in 2021:

(1) Looking from its origins, the *Journal of Civil Engineering and Management* has reached an important milestone this year, its 55th anniversary.

(2) Considering a new stage in the development of the journal after the JCEM was indexed by Web of Science in 2008, the 1000th article was published in 2021.

It turned 55 years since it has been started to publish series of studies of Civil Engineering: Collection of Mechanics, Reinforced Concrete Structures (both from 1967), later Building Materials and Structures, Building Structures, Building Economy and Organization, Building Economy and Management, Construction Technology and Management, Structural Repair and Strengthening.

In 1995, all these series of studies were combined into a single periodical research journal under the title in Lithuanian *Statyba* (*Eng. Civil Engineering*). Seven volumes, consisting of 4–6 issues, were published in 1995–2001.

In 2002, the journal was renamed to *Journal of Civil Engineering and Management* (JCEM) and started publishing papers only in English.

In 2008, the journal started the 5th decade of its history. Due to this occasion, Editorial paper was published in the 1st issue of 2008 [1]. Founder and Editor-in-Chief of the journal Prof.

Edmundas Kazimieras Zavadskas overviewed the development of the Journal in 40 years from its origins.

During the period of 2002-2008, the journal made a remarkable progress. In 2008 it reached a new stage of development: JCEM was indexed by Thomson Reuters (currently Clarivate Analytics) Science Citation Index (SCI) data base. The way to this achievement is overviewed by Edmundas Kazimieras Zavadskas in the 4th issue of 2008 [2]. Here you can explore accumulative increment of JCEM papers cited in Web of Science journals in 2002–2008.

Since 2011, the journal began to be published jointly by Vilnius Gediminas Technical University Press and Taylor & Francis. Electronic peer review and publishing platforms were launched and the number of submissions as well as internationalization of authors and reviewers increased. Therefore, the Journal's visibility expanded in the international academic world.

In 2014, the development results of the period were summarized in Editorial due to the 20th anniversary from beginning of a single periodical journal instead of several series of publications under the title of *Statyba* (*Eng. Civil Engineering*) and later *Journal of Civil Engineering and Management* [3]. If earlier the majority of papers were authored by Lithuanian researchers, the six years of indexing in Web of Science data base resulted more than 70 percent of foreign authors from 47 countries all over the World [3].

Starting 2018, the *Journal of Civil Engineering and Management* has been published entirely by Vilnius Gediminas Technical University Press. Our emphasis is now on publishing the highest quality articles and making them freely available to researchers worldwide. Now JCEM is published as an Open Access journal. The papers are published under a licence CC BY 4.0, which permits unrestricted use and distribution, provided the original author and source are credited. This ensure that the journal and the articles it publishes are free for all to read, which greatly improve the journal's impact and reputation. We were happy to announce these improvements in Editorial, intended for 25th anniversary from beginning of a single periodical journal and published in 2019 [4].

In the same year 2019, a comprehensive analysis and summary of the journal from the perspective of bibliometric was conducted [5]. The information analysed in this study were JCEM publications (only articles and reviews) indexed in Web of Science data base and dating between 2008 and 2018. Firstly, the general citation structure and basic characteristics of the JCEM journal were investigated. Then, the most influential institutions, countries as well as their networks of cooperation were identified. Finally, the main research topics of the JCEM journal were explored by using the frequently used keywords.

According to the data retrieved on January 25th, 2019, the most productive institutions during 2008-2018 and their cooperation network in JCEM publications is presented in Fig. 1.

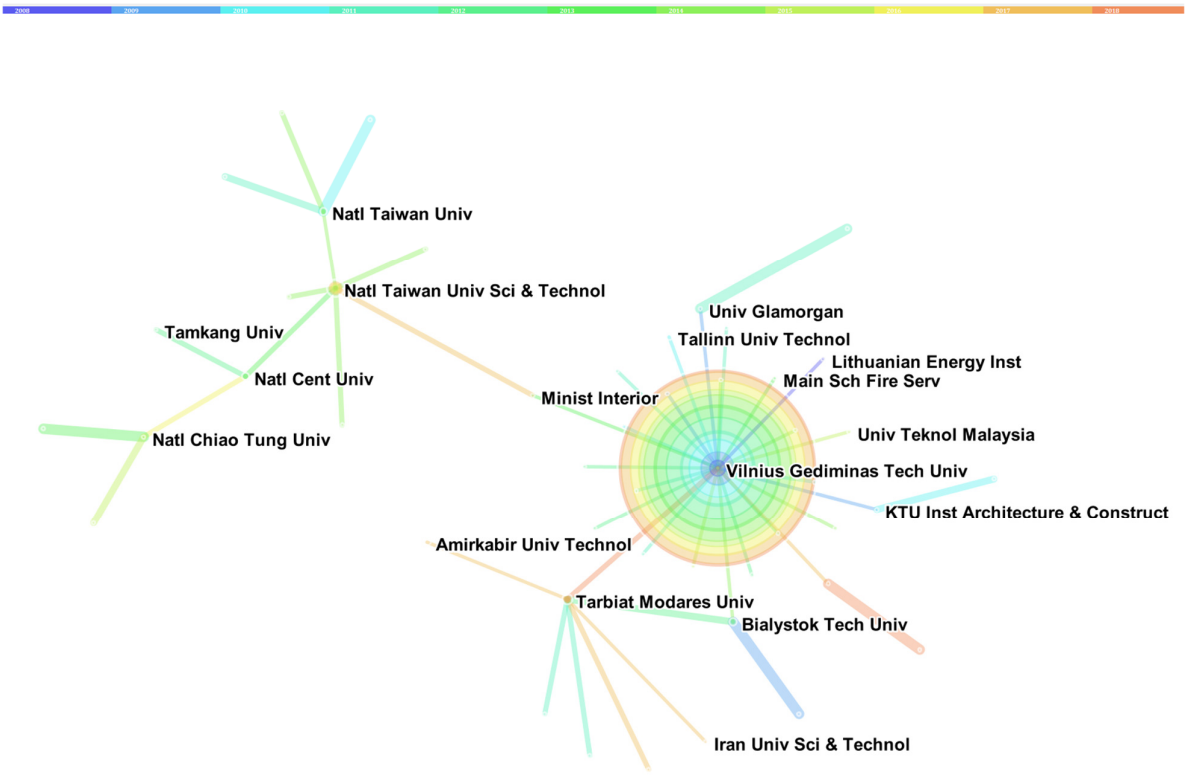


Figure 1. The biggest cooperation network at the institution level [5]

Regarding the most frequent topics of papers during 2008–2018, 'concrete' is the most frequently used author keyword in the JCEM journal. Some other keywords are 'construction industry', 'construction management', 'reinforced concrete', 'compressive strength', 'MCDM', 'simulation' and 'optimization' (Fig. 2).

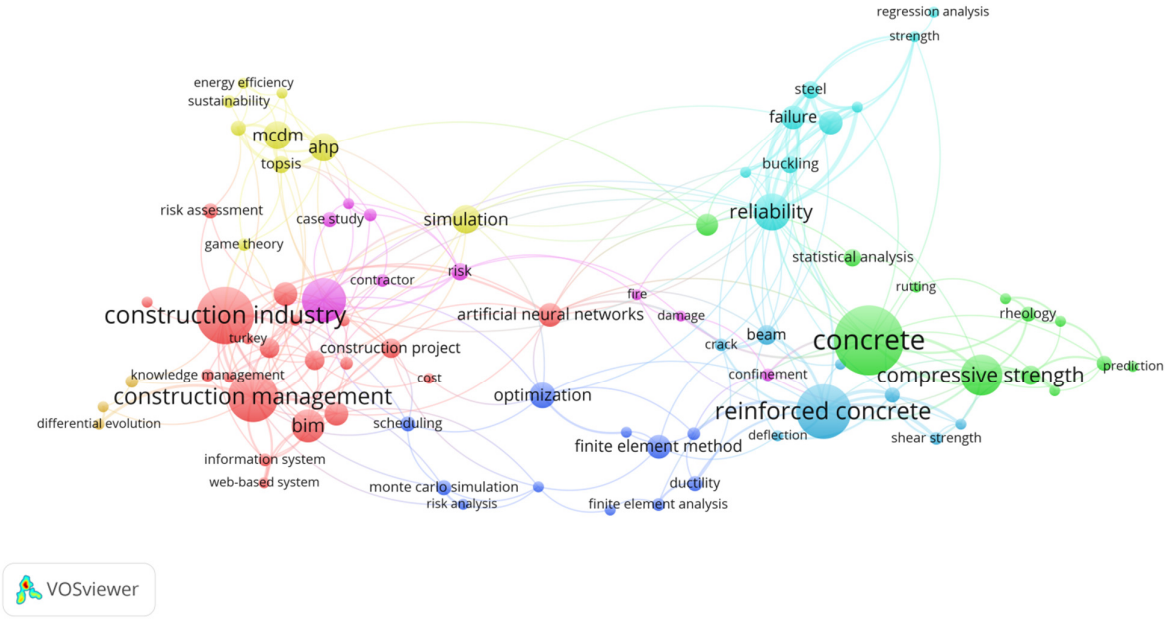


Figure 2. Co-occurrence of author keywords [5]

So far, the JCEM has published more than 1000 papers indexed in Web of Science data base since 2008. The 1000th paper was published in Vol. 27, issue 7, 2021. The latest available Clarivate Analytics Impact factor (2020) IF = 2.957. The Journal is currently ranked in the 56th position worldwide among 137 journals in "Engineering, Civil" Web of Science category and it is in the second quartile (Q2) of journals based on its worldwide impact in the category. This is resulted by times cited and publications over time (Fig. 3).

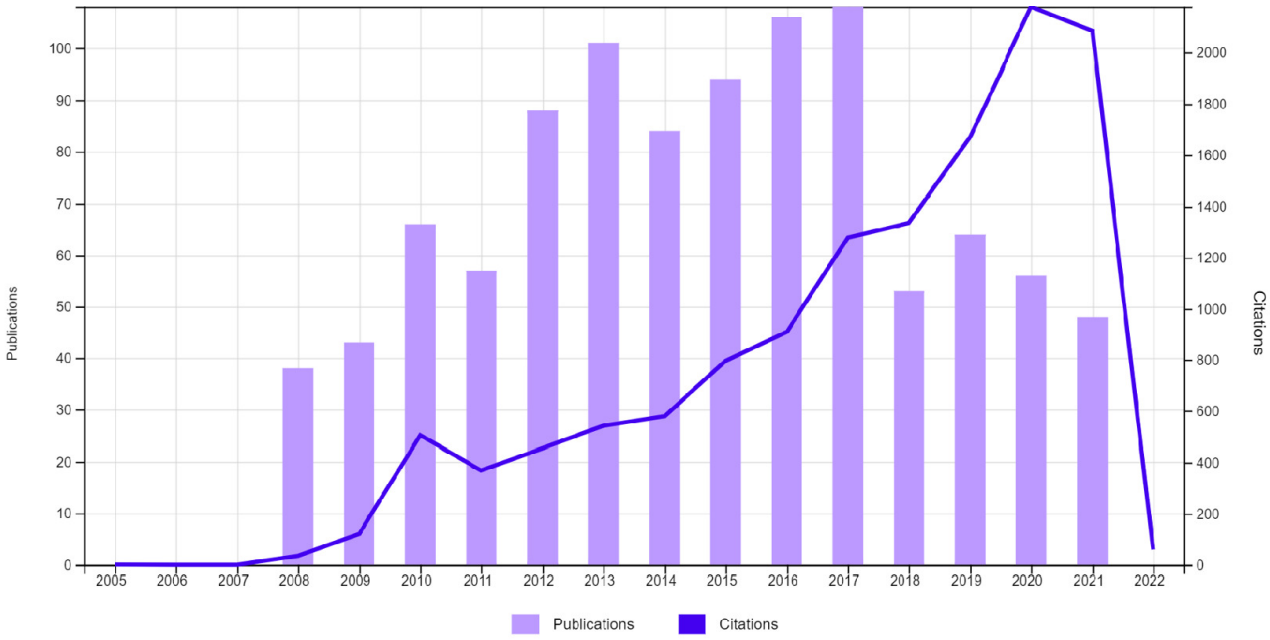


Figure 3. Times cited and publications over time [6]

Since 2020, Prof. Artūras Kaklauskas became the Editor-in-Chief of JCEM. The scope of the journal was extended by modern research topics in civil engineering. Currently *Journal of Civil Engineering and Management* publishes articles in the following fields: all stages of the building life cycle, affective computing, BIM, building materials and structures, constructions technology, construction economy and management, digital twin, fire protection, thermoinsulation and renovation of buildings, geotechnical engineering, information technologies in construction, intelligent decision support systems, IoT, labour safety in construction, operational research, road and bridge engineering, robotics, smart built environment, structural mechanics and physics, urban engineering and economy. The analysis of keywords shows that currently the main highly cited keywords are construction, project, analysis, model, concrete, optimization, development. The authorship of recent papers also significantly changed compared to previous decades. An analysis of the institutions of articles accepted in 2021 shows that 43 percent of the accepted articles are from institutions ranked in the TOP500 of the QS World University Ranking [7].

The Editors would like to express their sincerest gratitude to all those who have contributed to the success of the Journal, its quality and significance in the academic world. We are grateful to the Advisory Editors and the Editorial Board members for many years of cooperation and contribution in ensuring the quality of the Journal. We greatly appreciate efforts of Reviewers in providing valuable comments and suggestions aimed at improving the quality of submissions. Special thanks go to Researchers for choosing the *Journal of Civil Engineering and Management* to publish their research findings.

The authors of this brief overview invite all Members of our Working Group and all those interested in topics of civil engineering and management to access the full-text articles for deeper analysis:

https://journals.vgtu.lt/index.php/JCEM

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Review on "Creative trans-border cooperation in the field of operations research and sustainable development in civil engineering"

Kapliński, O., & Vilutienė, T. (2021). Creative trans-border cooperation in the field of operations research and sustainable development in civil engineering. *Technological and Economic Development of Economy, 27*(6), 1613-1639. https://doi.org/10.3846/tede.2021.16112

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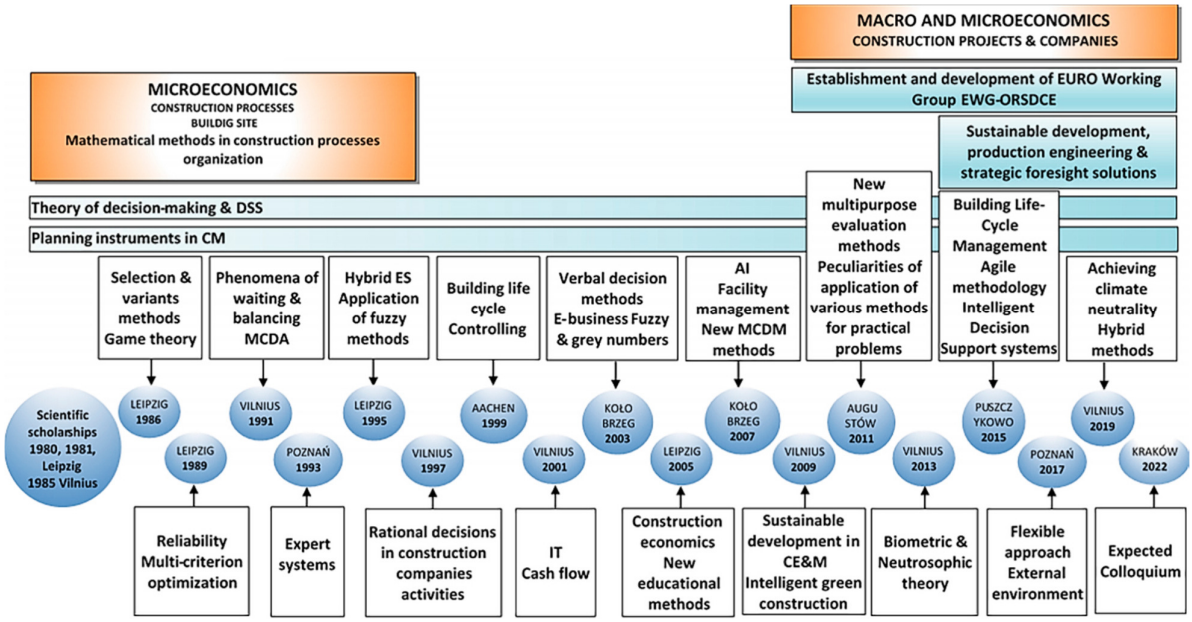
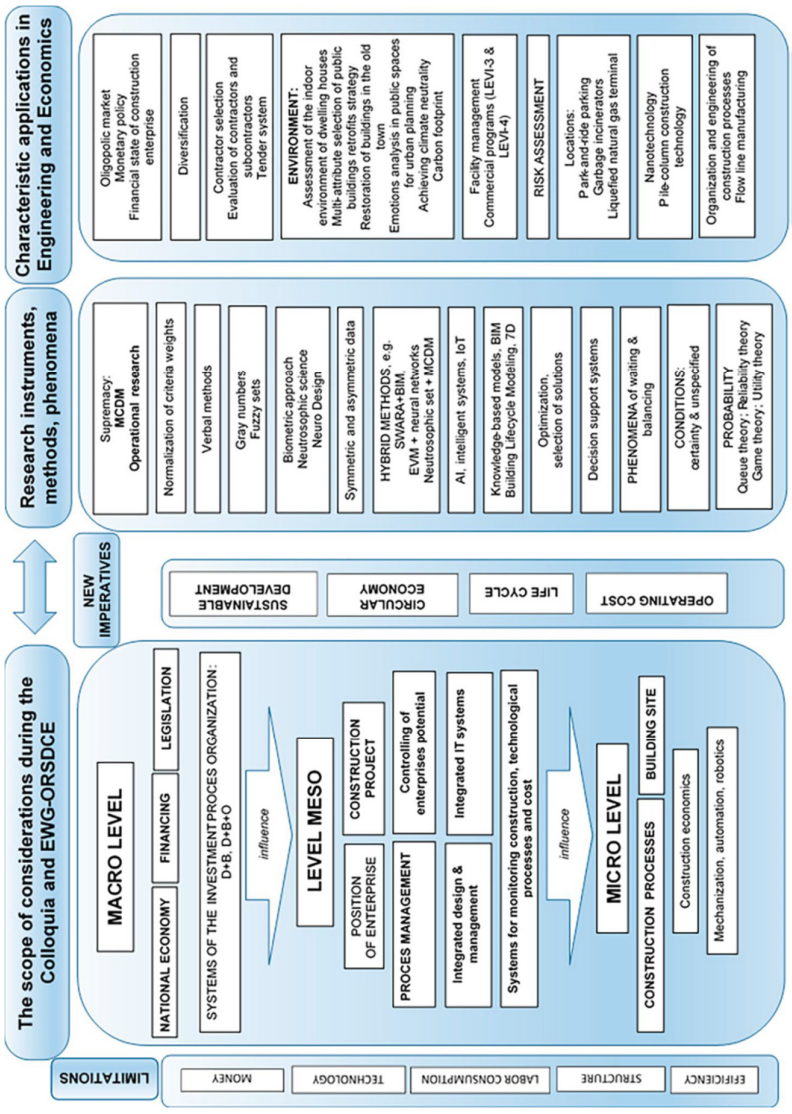
Abstract
The paper presents an overview of the history and achievements of trans-border cooperation in the Lithuania-Germany-Poland triangle in planning instruments in Construction Management, decision-making theory, application of Operational Research, and Multiple Criteria Decision Making (MCDM) methods in Civil Engineering and sustainable development. The cooperation and results of the Colloquiums with 35 years of tradition, their multidimensional nature is underlined. The research instruments, methods, studied phenomena are reviewed and characteristic applications in engineering and economics are presented. The knowledge and combined efforts of three academic centers have created a synergy which set in motion many original methods and spectacular implementations. The Colloquium calendar and the evolution of organizational forms are presented along with the inclusion of the informal EURO Working Group on Operations Research in Sustainable Development and Civil Engineering.

Keywords: scientific cooperation, operations research, MCDM, decisions, variants, micro and macroeconomics, sustainable development, civil engineering, EURO Working Group ORSDCE, review



Colloquia calendar and dominant topics (Kapliński & Vilutienė, 2021)

The cooperation networks of EWG ORSDCE (Kapliński & Vilutienė, 2021)



Multidimensionality and multi-application of the topics of the Colloquia (Kapliński & Vilutienė, 2021)

The special issues on the 100th anniversary of Lotfi A. Zadeh (1921–2017)

Xu, Z., & Herrera-Viedma, E. (2021). Advances in FUZZY techniques and applications: in occasion of Lotfi Zadeh 100 birth anniversary. *Technological and Economic Development of Economy*, *27*(2), 280-283. https://doi.org/10.3846/tede.2021.14582

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We Associate Editors, Professor Zeshui Xu from the Sichuan University, China, together with Professor Enrique Herrera-Viedma from University of Granada, Spain, have organized and edited the eight papers of this special issue to address a new research trend on the advances in fuzzy techniques and applications in supply chain management and financial economics. Considering that, the fuzzy techniques involved in the eight papers are all based on the fuzzy theory proposed by Zadeh, and they all well integrate the original fuzzy theory into various decision-making method and further properly be applied into the most popular fields of supply chain management (SCM) and finance economics. It is suggested that the eight papers are appropriate for the special issue on fuzzy technique in occasion of Lotfi Zadeh 100 birth anniversary.

The eight papers we selected according to the review criterion on technical contributions that highlight the evolving research concerning the fuzzy techniques and its applications in SCM and financial economics. Among them, the first four papers focus on the fuzzy techniques including TODIM, fuzzy COPRAS and FMIP and their applications in green supplier selection and industrial procurement. The fifth paper dedicates to investigating fuzzy modes integrating fuzzy EDAS, ABC analysis with fuzzy FUCOM for increasing business efficiency in inventory management. Supplier selection, procurement containing supplier and order allocation and inventory management are important parts of SCM. In this regard, the following paper gives an overview of fuzzy techniques in supply chain management and proposes future directions regarding fuzzy techniques in SCM. The last two papers mainly investigate the financial optimization models including fusion MRDM model for improving the AI-enabled auditing techniques and interval type-2 fuzzy solution approach for solving PPSS problem in which split of projects and re-execution are allowable.

Content of SI:

Tian, X., Niu, M., Zhang, W., Li, L., & Herrera-Viedma, E. (2021). A novel TODIM based on prospect theory to select green supplier with q-rung orthopair fuzzy set. Technological and Economic Development of Economy, 27(2), 284-310. https://doi.org/10.3846/tede.2020.12736

Chen, J., Xu, Z., Gou, X., Huang, D., & Zhang, J. (2021). Automobile components procurement using a DEA-TOPSIS-FMIP approach with all-unit quantity discount and fuzzy factors. Technological and Economic Development of Economy, 27(2), 311-352. https://doi.org/10.3846/tede.2020.13176

Wei, G., Wu, J., Guo, Y., Wang, J., & Wei, C. (2021). An extended COPRAS model for multiple attribute group decision making based on single-valued neutrosophic 2-tuple linguistic environment. Technological and Economic Development of Economy, 27(2), 353-368. https://doi.org/10.3846/tede.2021.14057

Lu, J., Zhang, S., Wu, J., & Wei, Y. (2021). COPRAS method for multiple attribute group decision making under picture fuzzy environment and their application to green supplier selection. Technological and Economic Development of Economy, 27(2), 369-385. https://doi.org/10.3846/tede.2021.14211

Vukasović, D., Gligović, D., Terzić, S., Stević, Željko, & Macura, P. (2021). A novel fuzzy MCDM model for inventory management in order to increase business efficiency. Technological and Economic Development of Economy, 27(2), 386-401. https://doi.org/10.3846/tede.2021.14427

Hu, K.-H., Chen, F.-H., Hsu, M.-F., & Tzeng, G.-H. (2021). Identifying key factors for adopting artificial intelligence-enabled auditing techniques by joint utilization of fuzzy-rough set theory and MRDM technique. Technological and Economic Development of Economy, 27(2), 459-492. https://doi.org/10.3846/tede.2020.13181

Zolfaghari, S., Mousavi, S. M., & Antuchevičienė, J. (2021). A type-2 fuzzy optimization model for project portfolio selection and scheduling incorporating project interdependency and splitting. Technological and Economic Development of Economy, 27(2), 493-510. https://doi.org/10.3846/tede.2021.14652

Lu, K., Liao, H., & Zavadskas, E. K. (2021). An overview of fuzzy techniques in supply chain management: bibliometrics, methodologies, applications and future directions. Technological and Economic Development of Economy, 27(2), 402-458. https://doi.org/10.3846/tede.2021.14433

Liao, H., & Plebankiewicz, E. (2021). Applications of fuzzy technology in civil engineering and construction management: the special issue in the 100th anniversary of Lotfi Zadeh. *Journal of Civil Engineering and Management*, *27*(6), 355-357. https://doi.org/10.3846/jcem.2021.15251

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Abstract
In papers published in Journal of Civil Engineering and Management, many applications of fuzzy logic can be found. To commemorate the contributions of the fuzzy set theory proposed by Professor Lotfi Zadeh to the fields of civil engineering and construction management, seven papers were selected for this special issue. These papers combined fuzzy set theory with appropriate methods to solve specialized problems in the fields of civil engineering and construction management, and provided good insights for the applications of fuzzy technology in solving problems related to civil engineering and construction management.

Keywords: civil engineering, construction management, fuzzy set, multiple criteria decision making, Lotfi Zadeh.

Content of SI:

Journal of Civil Engineering and Management, 27(6), 404-411. https://doi.org/10.3846/jcem.2021.15254

Plebankiewicz, E., Zima, K., & Wieczorek, D. (2021). Modelling of time, cost and risk of construction with using fuzzy logic. Journal of Civil Engineering and Management, 27(6), 412-426. https://doi.org/10.3846/jcem.2021.15255

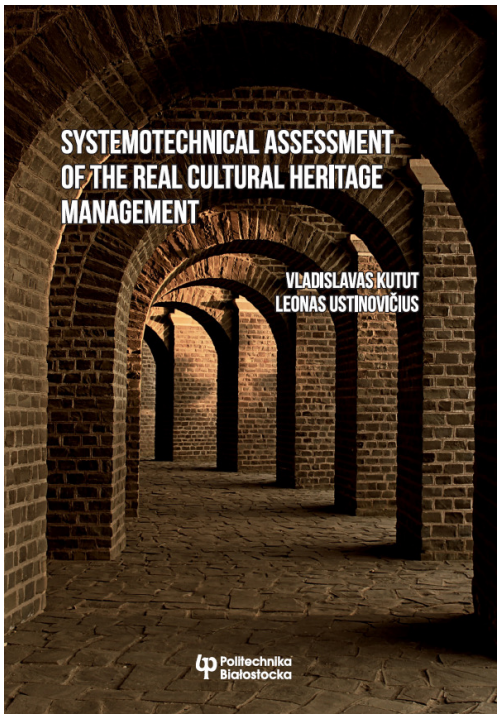
Baušys, R., Leščauskienė, I., & Semėnas, R. (2021). Participant trustworthiness analysis in the game-based urban planning processes by PROMETHEE-mGqNN approach. Journal of Civil Engineering and Management, 27(6), 427-440. https://doi.org/10.3846/jcem.2021.15263

Tirth, V., Wagale, M., Singh, A. P., Sarkar, A. K., Singh, R. K., Algahtani, A., & Islam, S. (2021). Investigating the adverse impacts of rural roads using a fuzzy multicriteria approach. Journal of Civil Engineering and Management, 27(6), 441-453. https://doi.org/10.3846/jcem.2021.15264

Carpio, M., Ortega, J., & Prieto, A. J. (2021). Expert panel on in-situ visual inspections for masonry churches maintenance stage. Journal of Civil Engineering and Management, 27(6), 454-471. https://doi.org/10.3846/jcem.2021.15256

The monograph published

Kutut Vladislavas; Ustinovičius Leonas. Systemotechnical assessment of the real cultural heritage management. Bialystok: Bialystok University of Technology, 2021.



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ISBN 978-83-66391-89-5 (eBook)
DOI: 10.24427/978-83-66391-89-5

Preface

Identification of the immovable cultural property management options is analyzed in this book by applying mathematical modeling and selective – innovation of multipurpose methods, which allow us to make comprehensive assessments of infrastructural, technological, technical, heritage, social, economic, legal aspects of the immovable cultural property management.

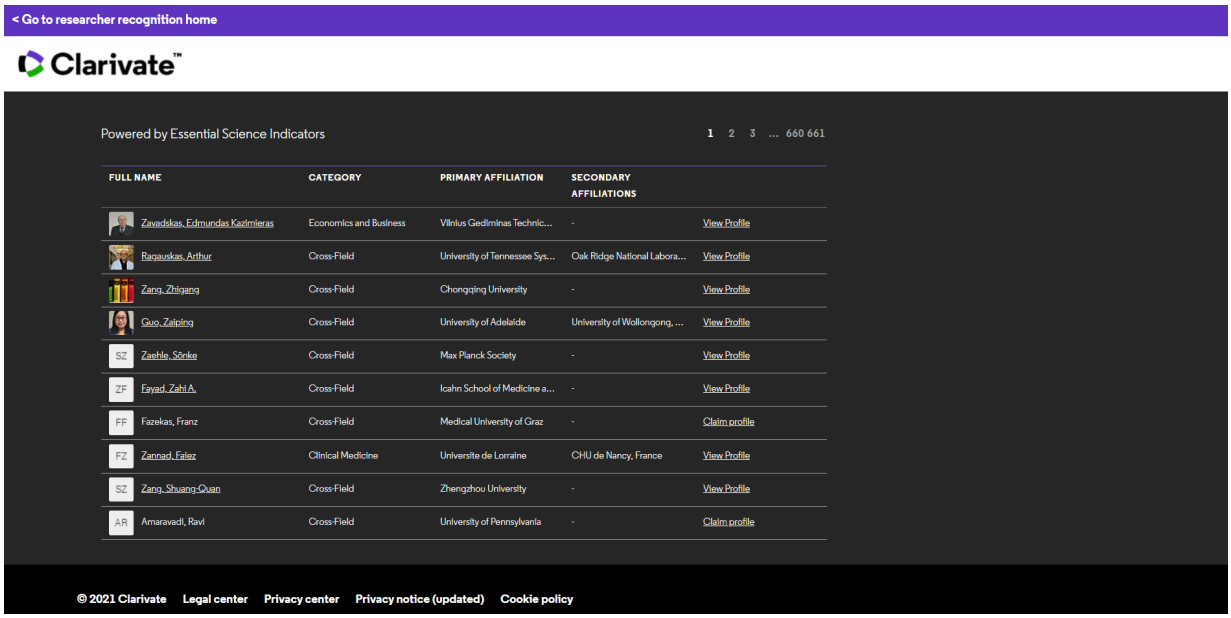
The main goal is to create a theory and a decision-making support system based on it, to increase the efficiency of investments in the immovable cultural property management by applying the mathematical modeling and selective – innovation of multi-purpose methods.

The authors describe the multi-criteria decision-making support systems for the immovable cultural property management projects and the ways of their practical application. Several practical decision-making solutions are presented, and a decision-making support system is developed to implement the described methods and techniques.

The publication is devoted to the researchers, engineering technologists, cultural heritage protection specialists, managers, Ph.D., and Master's degree students that are interested in the immovable cultural property research, design, and restoration management.

International recognition

Congratulations to the members of EWG-ORSDCE prof. Edmundas Kazimieras Zavadskas, prof. Zenonas Turskis and Dr. Abbas Mardani recognized being among the world's most influential researchers of the past decade, demonstrated by the production of multiple highly-cited papers that rank in the top 1% by citations for field and year in Web of Science. Experts from the Institute for Scientific Information provide exclusive insight into the list of Highly Cited Researchers 2021, including the methodology, country, and institutional breakdowns, and much more.



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FULL NAME	CATEGORY	PRIMARY AFFILIATION	SECONDARY AFFILIATIONS	
Zavadskas, Edmundas Kazimieras	Economics and Business	Vilnius Gedliminas Technic...	-	View Profile
Raqauskas, Arthur	Cross-Field	University of Tennessee Sys...	Oak Ridge National Labora...	View Profile
Zang, Zhigang	Cross-Field	Chongqing University	-	View Profile
Guo, Zaiping	Cross-Field	University of Adelaide	University of Wollongong, ...	View Profile
SZ Zaehle, Sönke	Cross-Field	Max Planck Society	-	View Profile
ZF Fayad, Zahi A.	Cross-Field	Icahn School of Medicine a...	-	View Profile
FF Fazekas, Franz	Cross-Field	Medical University of Graz	-	Claim profile
FZ Zannad, Faiez	Clinical Medicine	Universite de Lorraine	CHU de Nancy, France	View Profile
SZ Zang, Shuang-Quan	Cross-Field	Zhengzhou University	-	View Profile
AR Amaravadi, Ravi	Cross-Field	University of Pennsylvania	-	Claim profile

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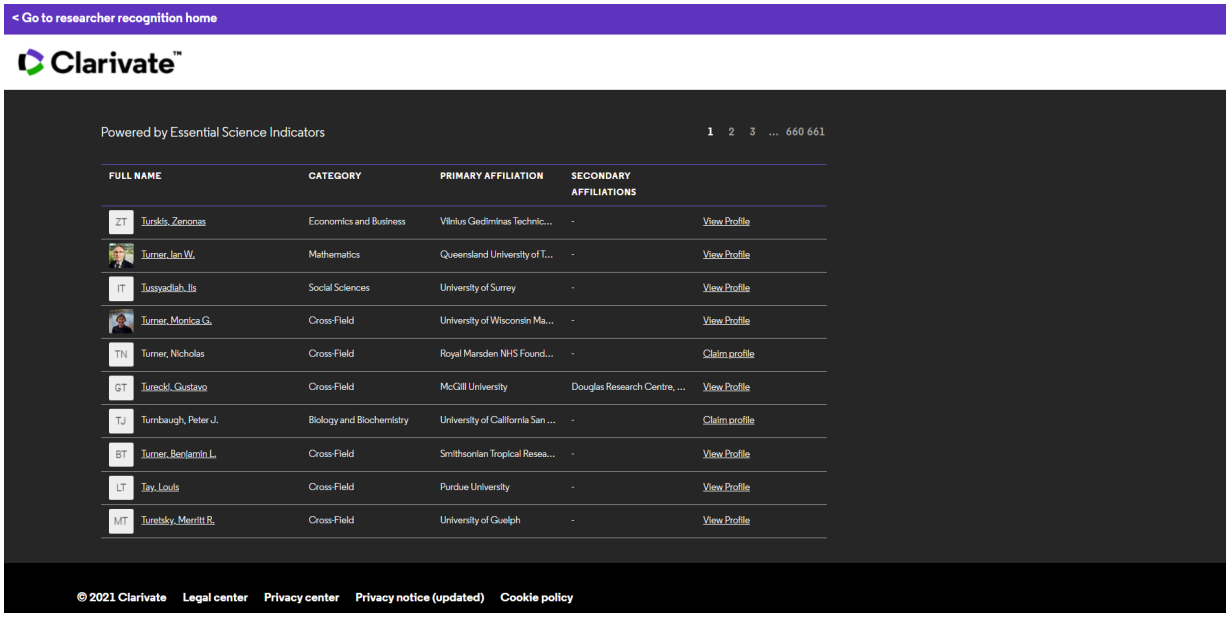

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ZT Turskis, Zenonas	Economics and Business	Vilnius Gedliminas Technic...	-	View Profile
Turner, Ian W.	Mathematics	Queensland University of T...	-	View Profile
IT Tussyadiah, Iis	Social Sciences	University of Surrey	-	View Profile
Turner, Monica G.	Cross-Field	University of Wisconsin Ma...	-	View Profile
TN Turner, Nicholas	Cross-Field	Royal Marsden NHS Found...	-	Claim profile
GT Tureckl, Gustavo	Cross-Field	McGill University	Douglas Research Centre, ...	View Profile
TJ Turnbaugh, Peter J.	Biology and Biochemistry	University of California San ...	-	Claim profile
BT Turner, Benjamin L.	Cross-Field	Smithsonian Tropical Resea...	-	View Profile
LT Tay, Louis	Cross-Field	Purdue University	-	View Profile
MT Turetsky, Merritt R.	Cross-Field	University of Guelph	-	View Profile

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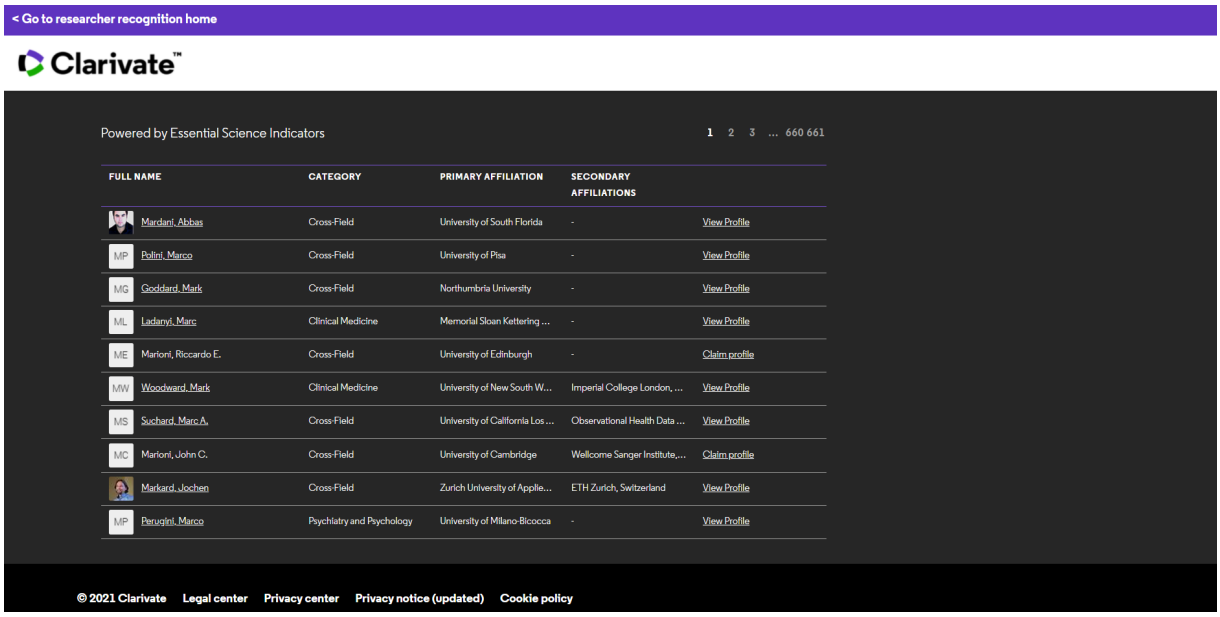

Find more here: https://recognition.webofscience.com/awards/highly-cited/2021/

Vilnius Gediminas Technical University (VILNIUS TECH) scientists are among the 2 percent best in the world

August 2021 data-update for "Updated science-wide author databases of standardized citation indicators"

Published: 19 October 2021 | Version 3 | DOI: https://doi.org/10.17632/btchxktzyw.3
Contributors: Jeroen Baas, Kevin Boyack, John P.A. Ioannidis

Stanford University, together with the publishing house Elsevier and SciTech Strategies, has created a ranking of 2% of the best scientists in the world. The dataset in version 3 (Baas et al., 2021) is based on the Scopus database as of Aug 01, 2021, and also includes the 2% best for each domain.
32 scientists from Lithuania were listed in the ranking, including 7 VilniusTech employees: Zavadskas E., Turskis Z., Kaklauskas A., Antuchevičiene J., Sivilevičius H., Kaklauskas G. The same VilniusTech employees were included in the selection of one thousand (1020) scientists in the area of Civil Engineering: Zavadskas E. (position 15), Turskis Z. (position 99), Kaklauskas A. (position 392), Antucheviciene J. (position 436), Ustinovicius L. (position 845), Sivilevicius H. (position 934), Kaklauskas G. (position 1019). The first 6 researchers also made it to last year's list.

"AD Scientific Index" (Alper-Doger Scientific Index)

The AD Scientific Index (Alper-Doger Scientific Index), unlike other systems that provide evaluations of journals and universities, is a ranking and analysis system based on the scientific

performance and the added value of the scientific productivity of individual scientists. Furthermore, it provides rankings of institutions based on the scientific characteristics of affiliated scientists. This new index has been developed by Prof. Dr. Murat ALPER (MD) and Associate Prof. Dr. Cihan DÖĞER (MD) by using the total and last 5 years' values of the i10 index, h-index, and citation scores in Google Scholar. In addition, the ratio of the last 5 years' value to the total value of the abovementioned indexes is used. Using a total of nine parameters, the "AD Scientific Index" shows the ranking of an individual scientist by 12 subject (https://www.adscientificindex.com/about-us/).

Three Lithuanian scientists Zavadskas E. K. (position in region 963) and Turskis Z. (position in region 5448) both from VilniusTech, and Ramanavičius A. (position in region 8627) from VU were listed in the European Top 10,000 scientists (https://www.adscientificindex.com/top-10000/EuropeTop10000.pdf?v1640863357).

Newly developed or extended methods

Edmundas Kazimieras ZAVADSKAS, Romualdas BAUSYS, Ingrida LESCAUSKIENE, Jamal OMRAN. (2020). M-generalised q-neutrosophic MULTIMOORA for Decision Making, *Studies in Informatics and Control, 29*(4), 389-398. https://doi.org/10.24846/v29i4y202001

Abstract
Different frameworks can be chosen to solve multicriteria decision making (MCDM) problems emerging in business, economy, health care, engineering and other areas. Uncertainty, vagueness and non-rigid boundaries of the initial information are frequently noticed when dealing with the practicalities of the MCDM tasks. Single-valued neutrosophic sets are considered as the effective tool to express uncertainty of the information, however in some cases it lacks the desirable generality and flexibility. The m-generalized q-neutrosophic sets (mGqNNs) were recently proposed to deal with this situation. The novel MCDM methodology MULTIMOORA-mGqNN is presented in this paper. An illustrative example that analyses the effectiveness of different cable root management decisions for the application in chemical industry is also provided to demonstrate the practicalities of the MULTIMOORA-mGqNN.

Zavadskas, E. K., Bausys, R., Lescauskiene, I., & Usovaite, A. (2020). MULTIMOORA under Interval-Valued Neutrosophic Sets as the Basis for the Quantitative Heuristic Evaluation Methodology HEBIN. *Mathematics, 9*(1), 66. http://dx.doi.org/10.3390/math9010066

Abstract
During the last decade, researchers put a lot of effort into the development of the multi-criteria decision methods (MCDM) capable of dealing with the uncertainty and vagueness of the initial information. MCDM approaches that work under the environment of the interval-valued neutrosophic sets (IVNS) demonstrate credibility for the analysis of different opinions as well as for the inconsistency of the criteria evaluation data. The novel multicriteria decision-making approach MULTIMOORA-IVNS (multi-objective optimisation by ratio analysis under interval-valued neutrosophic sets) is presented in this paper. A novel heuristic evaluation methodology HEBIN (heuristic evaluation based on interval numbers) that exploits MULTIMOORA-IVNS for the processing of the evaluation results is also presented in this research. HEBIN is able to increase the accuracy of the checklists-based heuristic evaluation and to diminish the impact of the inconsistencies caused by the evaluators. A comparison of six e-commerce websites is introduced to reveal the practicalities of the proposed multicriteria decision-making application.

Dorfeshan, Y., Mousavi, S. M., Zavadskas, E. K., & Antucheviciene, J. (2021). A New Enhanced ARAS Method for Critical Path Selection of Engineering Projects with Interval Type-2 Fuzzy Sets. *International Journal of Information Technology & Decision Making, 20*(01), 37–65. https://doi.org/10.1142/S0219622020500418

Abstract
Appraising the alternative among a set versus conflicting factors is taken into account as an essential issue in real-world decision problems. In this paper, a new multicriteria group decision-

making (MCGDM) model is introduced with a fuzzy relative preference relation (FRPR) concept and additive ratio assessment (ARAS) method. FRPR is a useful way to reduce time complexity and to avoid pairwise comparisons. Also, a new method for determining the weights of experts by using an extension of the reference point method is presented and added to this new MCGDM model for an aggregation of the experts' judgments. Finally, a case study about the selection problem of the engineering project in exploration and sampling projects of lead and zinc mine by decisive criteria are solved to denote the capability of the presented model. Furthermore, to illustrate the various applications of the proposed method in different decision problems, an example of literature is solved.

Ulutaş, A., Stanujkic, D., Karabasevic, D., Popovic, G., Zavadskas, E. K., Smarandache, F., & Brauers, W. K. (2021). Developing of a Novel Integrated MCDM MULTIMOOSRAL Approach for Supplier Selection. *Informatica, 32*(1), 145-161. https://doi.org/10.15388/21-INFOR445

Abstract
The main aim of the article is to propose a new multiple criteria decision-making approach for selecting alternatives, the newly-developed MULTIMOOSRAL approach, which integrates advantages of the three well-known and prominent multiple-criteria decision-making methods: MOOSRA, MOORA, and MULTIMOORA. More specifically, the MULTIMOOSRAL method has been further upgraded with an approach that can be clearly seen in the well-known WASPAS and CoCoSo methods, which rely on the integration of weighted sum and weighted product approaches. In addition to the above approaches, the MULTIMOOSRAL method also integrates a logarithmic approximation approach. The expectation from the development of this method is that the integration of several approaches can provide a much more reliable selection of the most appropriate alternative, which can be very important in cases where the performance of alternatives obtained by using some other method does not differ much. Finally, the ranking of alternatives based on the dominance theory, used in the MOORA and MULTIMOORA methods, is replaced by a new original approach that should allow a much simpler final ranking of alternatives in order to reach a stronger result with five different techniques. The suitability and efficacy of the proposed MULTIMOOSRAL approach are presented through an illustrative case study of the supplier selection.

Mahdiraji, H. A., Zavadskas, E. K., Arab, A., Turskis, Z., Sahebi, I. G. (2021). Formulation of Manufacturing Strategies Based On an Extended SWARA Method with Intuitionistic Fuzzy Numbers: An Automotive Industry Application. *Transformations in Business & Economics, 20*(2), 346-374.

Abstract
Applying any kind of manufacturing strategy requires evaluating the current situation of the system at the internal and external levels and providing strategies for improving the system performance. Hence, the study presents review and design the optimal manufacturing strategy for increasing the efficiency of the automotive industry. This article presents a three-step manufacturing strategy model using Miltenburg worksheet and extended the Stepwise Weight Assessment Ratio Analysis (SWARA) method into the intuitionistic fuzzy environment.
It concentrates on five manufacturing objectives encompassing the production system, manufacturing outputs, manufacturing leverage, production capabilities, and competitive analysis. First,the basis of current production system is Product\Volume Layout\Flow Matrix (PV-

LF) matrix. At the point, six manufacturing levers are analysed and assessed. The following step extends the SWARA method into the intuitionistic fuzzy environment. The research evaluates manufacturing outputs (delivery and cost, quality and performance) to define criteria of the optimal production system. Eventually, the study describes optimal strategies. Thus, the production system could change to the optimal policy. The results demonstrated that the case study production system is Equipment Paced Line Flow (EPL) and should vary from EPL to Just in Time (JIT). Furthermore, changing manufacturing levers is necessary to execute the proposed framework successfully.

Stanujkic D., Karabasevic D., Popovic G., Smarandache F., Zavadskas E. K. , Meidute-Kavaliauskiene I., Ulutaş A. (2021). Developing a Novel Approach for Determining the Reliability of Bipolar Neutrosophic Sets and its Application in Multi-Criteria Decision-Making. *Journal of Multiple-Valued Logic and Soft Computing, 37*(1-2), 151-167.

Abstract
This article aims to propose an approach for determining reliability of information collected using questionnaires and bipolar neutrosophic sets. Bipolar neutrosophic sets use six membership functions that express the truth membership, the falsity membership, as well as the indeterminacy membership to the set and complementary set. Therefore, bipolar neutrosophic numbers may be suitable for applying in multi-criteria evaluation when a smaller number of complex evaluation criteria are used. Unfortunately, a significant number of membership functions make them somewhat complex for collecting data by surveying respondents. Using reliability of data decision-makers can identify respondents who did not want to participate in the survey, or did not understand the application of BNNs, and take appropriate action. The usability of the proposed approach is presented through two illustrative examples and conclusions were drawn based on obtained results.

Stanujkic, D., Karabasevic, D., Popovic, G., Smarandache, F., Zavadskas, E. K., Meidutė-Kavaliauskienė, I. (2021). Multiple-criteria Decision-making Based on the Use of Single-valued Neutrosophic Sets and Similarity Measures. *Economic Computation and Economic Cybernetics Studies and Research*, *55*, 5–22. https://doi.org/10.24818/18423264/55.2.21.01

Abstract
As the generalization of the fuzzy and similar sets based on Fuzzy sets, neutrosophic sets provide significant possibilities in the case of solving complex decision problems, often related to uncertainty and unreliability. Neutrosophic sets use three values named the truth degree, the indeterminacy degree and the falsity degree, which allow for a more accurate evaluation of alternatives in relation to complex evaluation criteria. As a result of their application in solving numerous different decision-making problems, several approaches to their ranking have been proposed. Therefore, this paper provides a comprehensive overview of the approaches to the ranking of single-valued neutrosophic numbers and a comparison of the results obtained by using them. Finally, numerical illustrations are given.

Zavadskas, E. K., Kaklauskas, A., Bausys, R., Naumcik, A., & Ubarte, I. (2021). Integrated hedonic-utilitarian valuation of the built environment by neutrosophic INVAR method. *Land Use Policy, 101*, 105150. https://doi.org/10.1016/j.landusepol.2020.105150

Abstract
Hedonic valuation models enable us to make relevant decisions concerning the equipage of the built environment amenities and to establish more correct price zoning and land use management. These studies examining the utilitarian and hedonic aspects of property often face issues: how can we measure and assess multisensory experiences of property buyers (their affective attitudes, emotional states and physiological parameters) in an integrated manner and make a decision? This fact was a vital goal of the integrated Neutrosophic Degree of Project Utility and Investment Value Assessments along with Recommendation Provisions (INVAR) method. About 200 million multisensory data points have been collected so far and, as a result of their correlation analysis, several tens of thousands of average and robust correlations were determined. The new Neutrosophic INVAR method offers a bigger, more detailed picture of the hedonic-utilitarian value of the property. Another benefit of the Neutrosophic INVAR method is its ability to assist in assessing any project, determining its integrated hedonic-utilitarian value and offering tips on ways to make the project better. The Neutrosophic INVAR method can also optimise any criterion of your choice to make a specific project as competitive in the market and can determine the value that would propel the project to the top among the projects discussed. The analysis performed in this research is the basis for asserting that a sustainable development policy for housing and a surrounding environment is only possible by analysing the two-way process of interactions between a built environment and its neighbourhood residents in an integrated manner.

Keshavarz-Ghorabaee, M., Amiri, M., Zavadskas, E. K., Turskis, Z., & Antucheviciene, J. (2021). Determination of Objective Weights Using a New Method Based on the Removal Effects of Criteria (MEREC). *Symmetry, 13*(4), 525. http://dx.doi.org/10.3390/sym13040525

Abstract
The weights of criteria in multi-criteria decision-making (MCDM) problems are essential elements that can significantly affect the results. Accordingly, researchers developed and presented several methods to determine criteria weights. Weighting methods could be objective, subjective, and integrated. This study introduces a new method, called MEREC (MEthod based on the Removal Effects of Criteria), to determine criteria' objective weights. This method uses a novel idea for weighting criteria. After systematically introducing the method, we present some computational analyses to confirm the efficiency of the MEREC. Firstly, an illustrative example demonstrates the procedure of the MEREC for calculation of the weights of criteria. Secondly, a comparative analysis is presented through an example for validation of the introduced method's results. Additionally, we perform a simulation-based analysis to verify the reliability of MEREC and the stability of its results. The data of the MCDM problems generated for making this analysis follow a prevalent symmetric distribution (normal distribution). We compare the results of the MEREC with some other objective weighting methods in this analysis, and the analysis of means (ANOM) for variances shows the stability of its results. The conducted analyses demonstrate that the MEREC is efficient to determine objective weights of criteria.

Semenas, R., Bausys, R., & Zavadskas, E. K. (2021). A Novel Environment Exploration Strategy by m-generalised q-neutrosophic WASPAS. *Studies in Informatics and Control*, *30*(3), 19–28. https://doi.org/10.24846/v30i3y202102

Abstract
Unknown environment exploration by an autonomous robot is a complex problem that requires robustness and reliability of the applied exploration strategy. Currently, a common approach to autonomous exploration is to incrementally increase the robot's knowledge about the environment by directing it to the regions which border currently unexplored areas (frontiers). However, deciding where to move next when multiple alternatives are present introduces an additional layer of complexity. As such, a decision might require balancing the competing high-level objectives (for example, visiting several priority locations while also reducing the robot travelled distance). This research proposes a novel environment exploration strategy and the extension for the WASPAS multi-criteria decision making (MCDM) method, modelled under the m-generalised q-neutrosophic environment, namely, WASPAS-mGqNS. The proposed method is applied to address the problem of selecting the next frontier that the exploring robot should reach. Case study results highlight how the proposed approach could be applied to minimise the robot-travelled distance and maximise the observed environment when the robot is tasked to visit several priority locations set in advance by the robot operator.

New scientific papers

The list presents papers co-authored by the members of EWG-ORSDCE and published in 2021 only in journals with IF.

Abu Adi Wedad; Hiyassat Mohammad; Lepkova Natalija. Business strategy development model for applying knowledge management in construction. Journal of civil engineering and management. vol. 27, iss. 4 (2021), p. 246-259.

Alipour, M., Hafezi, R., Rani, P., Hafezi, M., & Mardani, A. (2021). A new Pythagorean fuzzy-based decision-making method through entropy measure for fuel cell and hydrogen components supplier selection. Energy, 234, 121208.

Al-Refaie Abbas; Jarrar Yasmeen; Lepkova Natalija. Sustainable design of a multi-echelon closed loop supply chain under uncertainty for durable products. Sustainability. vol. 13, iss. 19 (2021), p. 1-34.

Amiri, M., Hashemi-Tabatabaei, M., Ghahremanloo, M., Keshavarz-Ghorabaee, M., Zavadskas, E. K., & Antuchevičienė, J. (2021). A novel model for multi-criteria assessment based on BWM and possibilistic chance-constrained programming. Computers & industrial engineering, 156, 1-16.

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Amiri, M., Hashemi-Tabatabaei, M., Ghahremanloo, M., Keshavarz-Ghorabaee, M., Zavadskas, E. K., & Kaklauskas, A. (2021). Evaluating Life Cycle of Buildings Using an Integrated Approach Based on Quantitative-Qualitative and Simplified Best-Worst Methods (QQM-SBWM). Sustainability, 13(8), 4487.

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New journal established

ESIC Digital Economy & Innovation Journal (EDEIJ), is a refereed international publication on Digital Economy and Innovation edited by ESIC University (https://revistasinvestigacion.esic.edu/edeij/index.php/edeij/index)

Editor-in-Chief

Dr. Morteza Yazdani - ESIC University, Madrid, Spain

Aims and Scope

EDEIJ Journal is an international scientific publication on Digital Economy and Innovation edited by ESIC Business & Marketing School.

It is precisely its international character that makes its leiv motive to become a space for the dissemination of quality scientific work on Digital Economy and Innovation from a multidisciplinary perspective.

In this sense, the journal focuses on both basic and applied original research, without neglecting experimental, epistemological and descriptive issues. Likewise, literature reviews and articles for reflection are a fundamental part of this journal. All of them are powerful tools to promote the quality of knowledge and excellence so demanded by the sector and society in general.

With this objective, the task of generating quality, motivating, attractive, updated, concrete and concise content has been imposed and linked to scientific contributions that explore the possibilities that technology, in its constant development, carries out to the field of the digital economy, innovation, digital transformation and internet marketing.

Likewise, they want to make their pages a forum for discussion where the scientific community can share their results. Which, without a doubt, will lead to progress, both academically and in the business sector and society as a whole. Taking into account the technological development achieved by today's society, what better way to achieve this goal and reach the entire specialized scientific community than by publishing your articles, directly, on an online platform of scientific publications such as OJS.

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- Digital advertising
- Neuromarketing and customer analytics
- Legal and ethics in the digital ecosystem
- Innovation and knowledge matters
- Industry 4.0 & Blockchain
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The articles will be published continuously, closing the numbers three times a year: January, May and September.

Author Guidelines (here)

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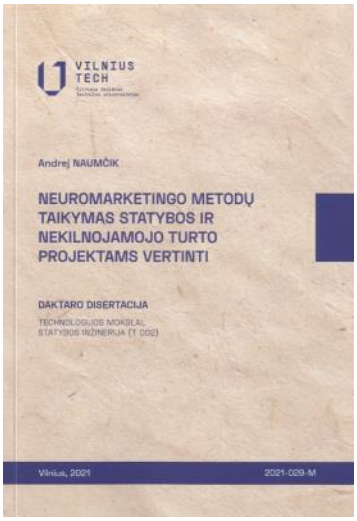
Recently finished and ongoing research projects

No.	Programme	Project	Short name	Date from - to	Responsible person (project manager)
1	HORIZON2020	Regeneration and Optimisation of Cultural heritage in creative and Knowledge cities https://rockproject.eu/	ROCK	2017-2020	Prof. Habil. Dr. Artūras Kaklauskas
2	HORIZON2020	BIM based tools for fast & efficient renovation https://bim4ren.eu/	BIM4REN	2018-2022	Prof. Habil. Dr. Artūras Kaklauskas
3	HORIZON2020	Students Achieving Valuable Energy Savings https://saves.unioncloud.org/articles/welcome-to-saves2	SAVES2	2017-2021	Prof. Dr. Audrius Banaitis
4	HORIZON2020	Network for Using BIM to Increase the Energy Performance http://www.net-ubiep.eu/lt/home-lt/	Net-UBIEP	2017-2019	Assoc. Prof. Dr. Tatjana Vilutienė

PhD Dissertations defended during 2021

Andrej NAUMČIK

APPLICATION OF NEUROMARKETING METHODS FOR THE EVALUATION OF CONSTRUCTION AND REAL ESTATE PROJECTS



Supervisor

Prof. Dr Habil. Edmundas Kazimieras ZAVADSKAS

Object of the thesis

The research object is the application of neuromarketing in the real estate as a phenomenon that explains customers' choices is the research object.

Aim of the thesis

The aim of the research is to design a model based on neuromarketing principles that intends to select energy-efficient real estate that matches customers' expectations. It is oriented towards the model that could be flexibly applied and adapted to the real estate that features (or does not feature) characteristics of energy efficiency.

Research methodology

The investigation and development of the concept of neuromarketing employed the historical, concept analysis methods. The applied methods of systematic and comparative analysis, logic and synthesis allowed grouping the neuromarketing techniques applicable in the construction and real estate market research. To design the model based on neuromarketing principles for the energy-efficient real estate market, the following methods were used: mathematical modelling, logical analysis and synthesis. To collect the data from the empirical study, remote photoplasmography was performed using FaceReader 7.1 with an optional remote photoplethysmography module, a breath sensor, an infrared camera, and an indoor mini-dome IP camera. Multicriteria analysis was performed using INVAR method. The following quantitative and qualitative research methods were also used in carrying out empirical research: descriptive statistics, statistical analysis, comparative analysis and synthesis, generalisation.

Practical value of the research findings

The designed model based on neuromarketing principles aims to propose energy efficient housing that matches needs and expectations of potenctial customer in a timely manner. This model based on neuromarketing principles allows precise and fast collection of data on geographical, demographical, psychological criteria of real estate consumers for low labour costs; therefore, it should be treated as an attractive means for top managers, marketing specialists of organisations. The results of an empirical study evaluating four energy efficient real estate objects, showed that application of the designed model provides preconditions to more precisely, faster and more objectively estimate the needs of potential buyers of real estate objects in terms of the real estate object characteristics and price, promotion, grounding on depersonalised emotional-psychological conditions, heart rate of potential buyers. The model can be

applied in various segments of the construction and real estate market, i.e. in work with both natural and juridical persons.

Defended statements

1. The designed model based on neuromarketing principles provides preconditions for segmentation of potential consumers of real estate ccording to their demographic, physiological characteristics, at the background of neuromarketing methods, has advantage in its capacities to prepare solutions that match the demands of potential buyers of housing.
2. Seeking to identify where people would like to live, it is purposeful to carry out segmentation of the market according to geographical, demographical, psychological, consumer behaviour criteria grounding on the somatic marker hypothesis.
3. The proposed method of neuromarketing is suitable when seeking to choose the most suitable solutions of marketing communication for energy-efficient housing, with regard to the differences in potential market life cycle experience, personal traits, age.

Approval of the research findings

7 articles have been published on the topic of the doctoral dissertation.

Miroslavas PAVLOVSKIS

MODELLING OF SUSTAINABLE CONVERSION OF HERITAGE BUILDINGS

Supervisor

Prof. Dr Jurgita ANTUCHEVIČIENĖ

Object of the thesis

The research object of the thesis is modelling of sustainable conversion of built heritage.

Aim of the thesis

The aim of the thesis is to create a conceptual model structure to describe and evaluate sustainable conversion of built heritage objects, to create possible solutions to problem situations, to find rational solutions and to form a conceptual model structure based on building information modelling technologies and multiple criteria decision making methods.

Research methodology

The analysis and generalization of foreign and Lithuanian scientific literature were applied to solve the tasks provided in the work. The system of evaluation criteria for the efficiency of heritage conversion was developed on the basis of the analysis of scientific articles of foreign and Lithuanian researchers, as well as legal acts of congresses of heritage protection organizations. The relative significance of the criteria was determined by the expert estimation method. Experimental BIM 3D modelling of built heritage objects was performed using software from different manufacturers. The multiple criteria decision making method Rough WASPAS is used to determine the rational alternative of built heritage conversion.

Practical value of the research findings

The results of the research and the proposed model of conversion of built heritage objects can be useful for the cooperation of all built heritage stakeholders. A practically applied model is needed to increase the efficiency of solutions, reduce the level of uncertainties and risks, addressing the issues of conversion of built heritage objects in the context of sustainable development, and identify solutions that best meet the expectations of all stakeholders. The advantages of the conversion of historic buildings, such as economic, environmental and social benefits and the promotion of novelty, have been identified.

The presented experimental examples show that the proposed model can be effectively applied in the field of heritage management in order to properly and qualitatively preserve built heritage objects. Modern technologies allow to restore lost elements of historic buildings, taking into account the uniqueness of architectural elements, authentic construction technologies and historic materials.

Defended statements

1. The built heritage must be preserved, but not conserved, actively integrated into the life of modern society, preserving the authenticity of heritage sites and meeting the needs of various stakeholders, based on modern digital technologies and scientific decision-making methods.

2. The application of the criteria system for assessing built heritage conversion solutions makes it possible to evaluate alternatives of conversion concepts in a complex way, taking into account the principles of sustainable construction, and to select the best alternative for the selected object.

4. The conceptual model for the sustainable conversion of built heritage provides opportunities to integrate existing reality creation, building information modeling (BIM) technologies and multiple criteria decision making methods (MCDM) in order to make a rational and sustainable solution for the conversion of built heritage.

Approval of the research findings

The key research findings were announced in ten research papers.

Editor's comments

Dear EWG-ORSDCE members, dear friends,

In year 2022 all members of EWG-ORSDCE are welcome to participate in the forthcoming 18th Colloquium „New Trends in Construction Management ", and 8th meeting of EURO working group OR in Sustainable Development and Civil Engineering that will be held on 19-20 of May, 2022 in Cracow University of Technology, Poland. In addition, you are invited to the 32nd European Conference on Operational Research (EURO 2022) to be held on 3-6 July, 2022 Espoo, Finland. The papers presented in these meetings are welcome for publishing in scientific journals: *Technological and Economic Development of Economy, Journal of Civil Engineering and Management, Journal of Business Economics and Management, International Journal of Strategic Property Management,* and *Engineering Structures and Technologies*.

On behalf of the Editorial Board of EWG-ORSDCE Newsletter
Audrius Banaitis