

Bibliometric analysis of journals published by Vilnius Gediminas Technical University

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Vilnius Gediminas Technical University (VINIUS TECH) publishes fifteen open access peer reviewed scientific journals. Seven of them are in the field of physical and technology sciences, five in the social sciences, one in humanities, and two are multidisciplinary. We are proud to declare that seven of these journals are indexed in Clarivate Analytics Web of Science database. The mostly of these journals are related to the research field of our Working Group.

Last year two journals founded by Professor Edmundas Kazimieras Zavadskas celebrated the twenty fifth anniversary since they have been launched (Journal of Civil Engineering and Management, and Technological and Economic Development of Economy).

Journal of Civil Engineering and Management (JCEM) is a prestigious journal in the field of engineering published eight issues per year:

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

The Journal was launched in 1995 as a per-reviewed quarterly journal under the title “Statyba” (Civil Engineering). In 2002, the current title “Journal of Civil Engineering and Management” was assigned. Since 2008, the Journal reached a new stage of development. The Journal was abstracted/indexed by international databases, including SCOPUS, COMPENDEX, INSPEC, Cambridge Scientific Abstract, EBSCO Publishing, etc. Since 2010, it has been encouraged by CIB (International Council of Research and Innovation in Building and Construction).

In 2008, JCEM was indexed by Clarivate Analytics Web of Science and the first Impact Factor (IF) was provided in 2010. The latest Journal Impact factor IF = 2.338, its quartile in the category is Q2 and it ranks 47th out of 134 ‘engineering, civil’ categorized journals (data from the 2019 edition of Journal Citation Reports).

So far, the JCEM has published more than 1000 papers in the field of civil engineering. Therefore, a comprehensive analysis and summary of the journal from the perspective of bibliometric was conducted in the paper of Yu, Xu and Antuchevičienė, 2019 [1]:

<https://journals.vgtu.lt/index.php/JCEM/article/view/9925/8713>

This research [1] used the method of bibliometric to study the status and development trends of the journal. Information was collected from the Science Citation Index (SCI) database. 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.

The main analysis results were as follows: 53 percent of the JCEM papers were equal to or less than 10 pages and there was clear evidence of an increase in the average number of pages. The number of references of the JCEM papers concentrated on 21-40, and the share of papers with more than 30 references increased significantly. The most popular pattern of co-authorship was 2 or 3 authors. Lithuania was the most productive country with more than twice the number of papers of Poland which is in the second place (Fig. 1).

Within the top 11 productive institutions, Lithuania and USA have two institutions, respectively. South Korea, China and Australia have strong cooperative relations with the USA. The partnership between Australia and China, Lithuania and Poland, Lithuania and Iran are also strong. VILNIUS TECH cooperated most with other institutions. In addition, Kaunas University of Technology from Lithuania, Wrocław University of Science and Technology from Poland, National Taiwan University of Science and Technology from Taiwan, Islamic Azad University from Iran and University of Malaya from Malaysia occupied important positions in the cooperative network (Fig. 2).

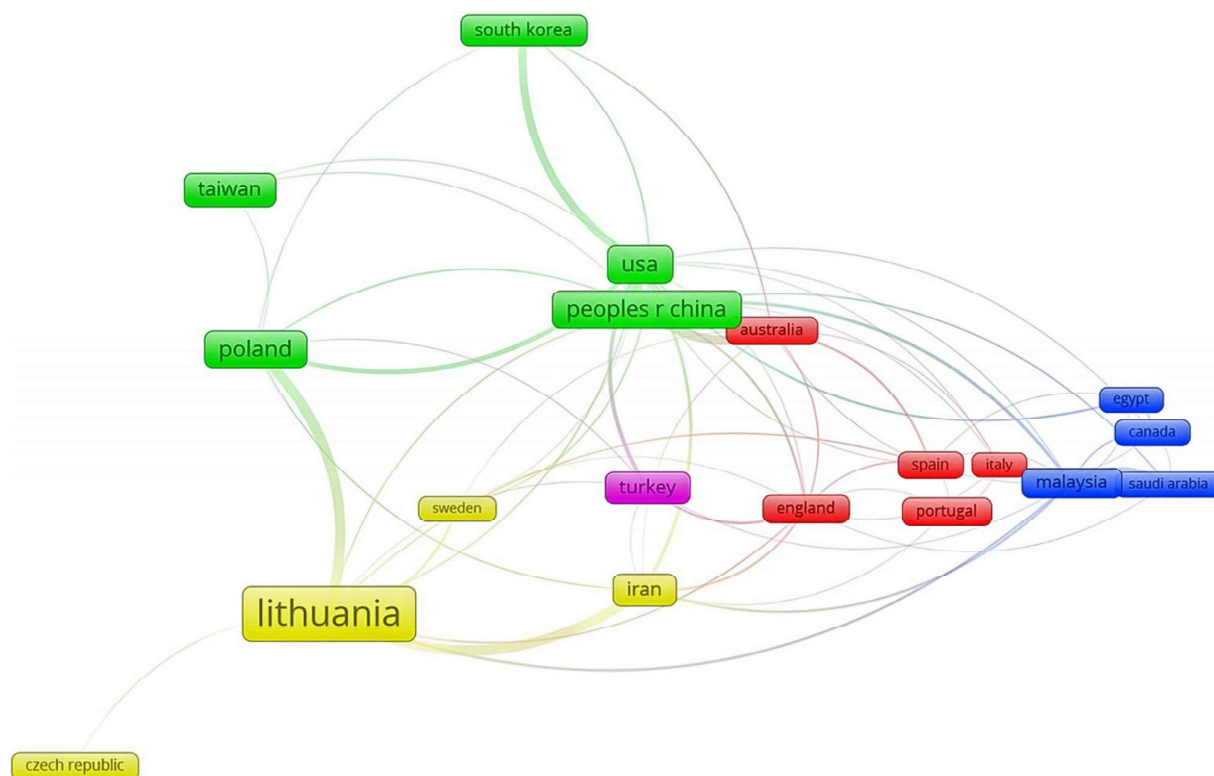


Figure 1. Cooperation networks at the country/territory level in JCEM publications [1]

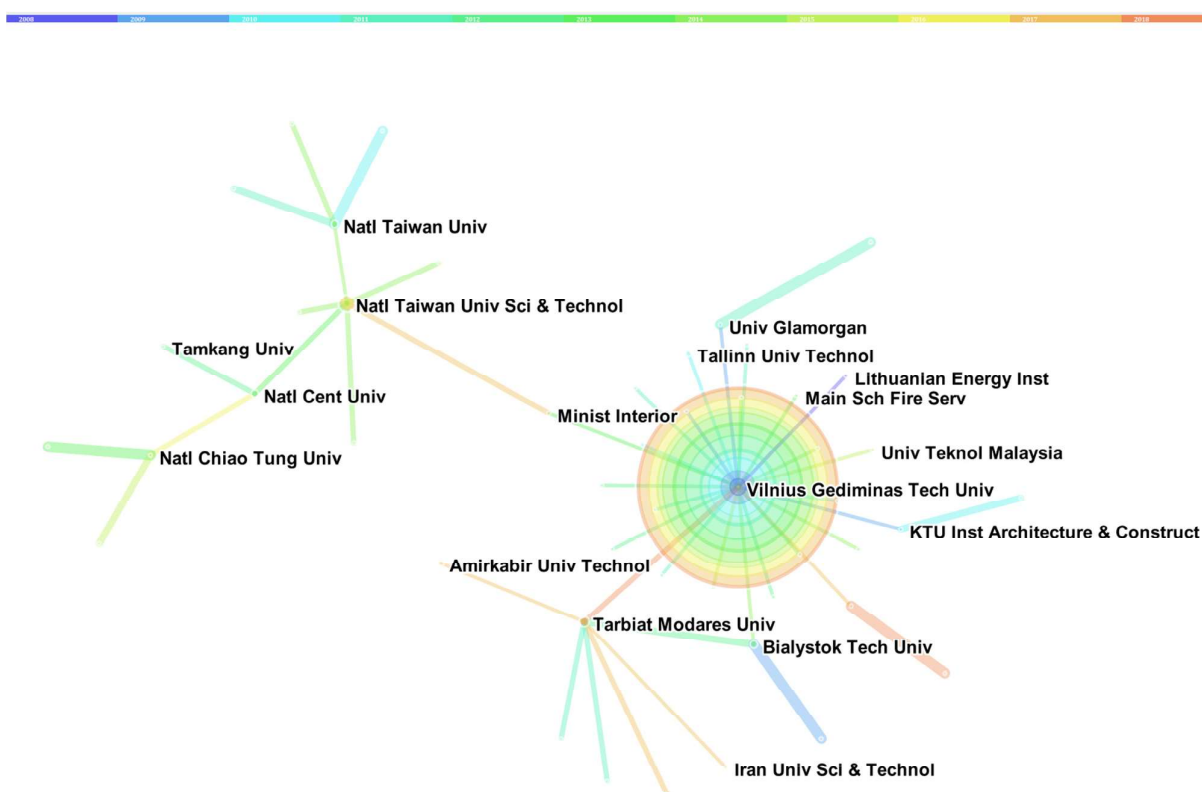


Figure 2. The biggest cooperation network at the institution level in JCEM publications [1]

'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. 3).

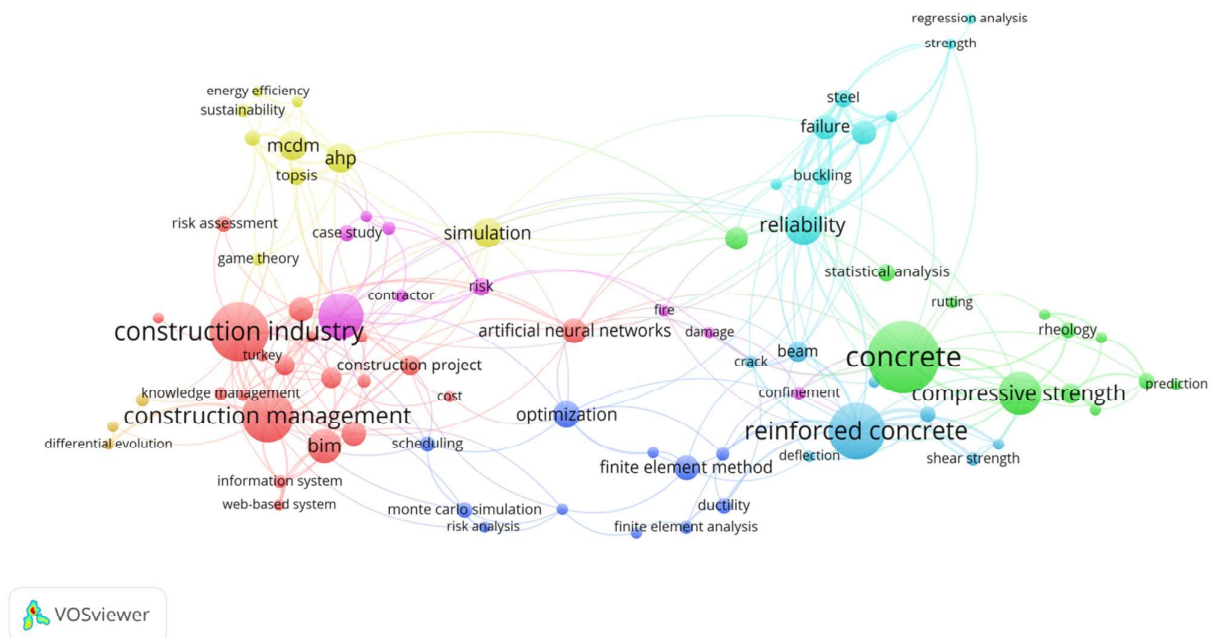


Figure 3. Co-occurrence of author keywords of the JCEM publications [1]

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The Journal ***Technological and Economic Development of Economy (TEDE)*** publishes original research, review articles and book reviews on all areas of sustainable economic development including political, economic and technological economic strategies:

<https://journals.vgtu.lt/index.php/TEDE/index>

<https://journals.vgtu.lt/index.php/TEDE/article/view/10193/8874>

In 2008, TEDE was indexed by Science Citation Index Expanded, Web of Science and the Impact Factor (IF) was provided in 2010. The latest currently available Journal ranking is as follows: Journal Impact Factor (Clarivate Analytics, 2019) JIF = 2.194; 5-years Journal Impact Factor = 2.786; SCOPUS CiteScore 2019 is 5.7; SCImago Journal Ranking (2019), SJR = 0.622; SCOPUS Source Normalized Impact per Paper (2019), SNIP = 1.196. TEDE enters the second quartile (Q2) under the "Economics" category of the Clarivate Analytics Web of Science. The Journal is currently ranked in the 98th position worldwide among 371 journals in the category.

The study of Yu, Xu and Šaparauskas, 2019 [2] presented a bibliometric analysis on all the TEDE publications indexed in the SSCI database. The basic characteristics of the TEDE journal, including annual and geographical distributions, author and manuscript characteristics, as well as the influential contributors were studied in detail. The results indicated that the number of papers published each year by the TEDE journal was relatively small and stable. The 55 percent of publications were authored through inter-institutions cooperation, and most of the papers were published through cooperation among multiple authors. The TEDE publications with two or three authors accounted for the majority, but the proportion of one or two authors was gradually decreasing. The publications with authors from one country or institution accounted for the vast majority, but their shares continue to decline. Authors from European and Asia countries predominately contributed the publications in the TEDE journal. The results of this study showed

that the authors of the TEDE journal were mainly distributed in Lithuania, China, Taiwan, Turkey, Poland and other countries/territories. Publications with 11–20 pages have been dominated at three different stages. Meanwhile, the publications with 20 or more references accounted for most of the proportion. As explored by co-occurrence analysis of keywords, decision analysis has become an important research topic in the TEDE journal (Fig. 4) [2].

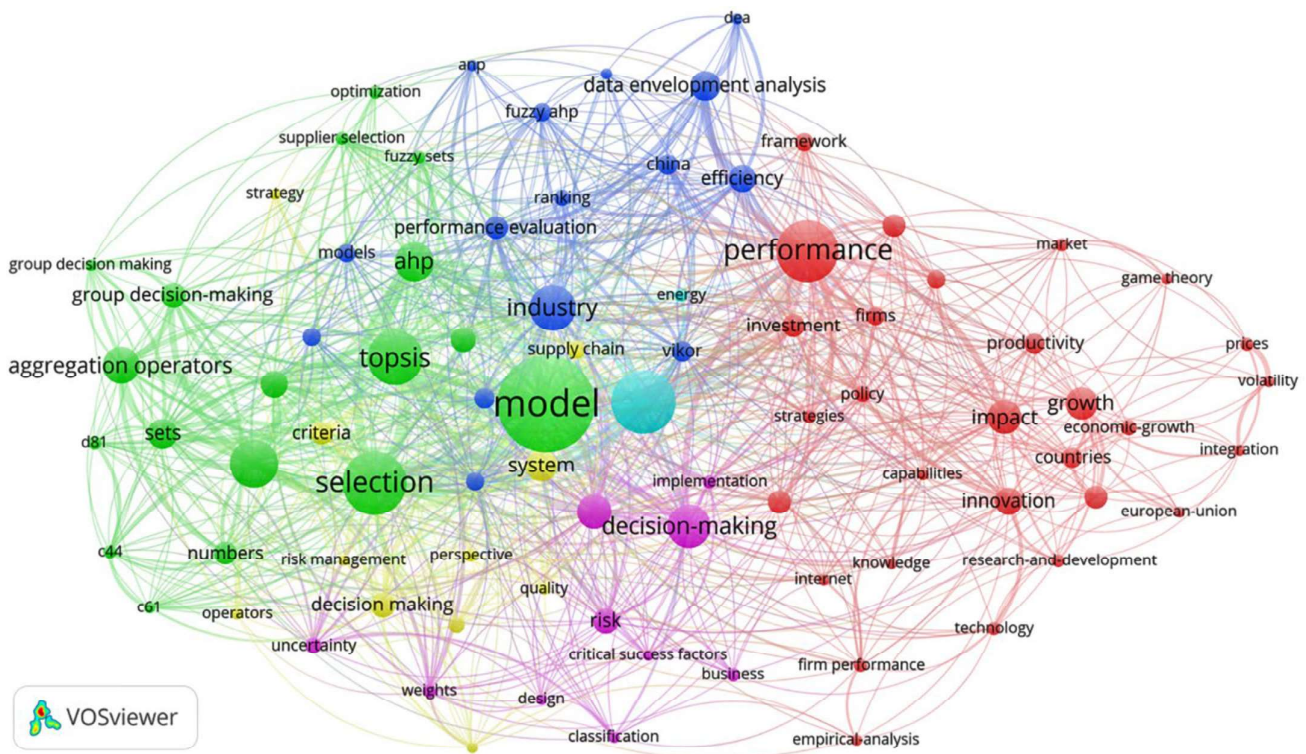


Figure 4. Co-occurrence network of keywords of the TEDE publications [2]

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The bibliometric analysis was also made for several other VILNIUS TECH journals, whose topics are related to the research field of our Working Group.

The paper of Zhou, Xu and Zavadskas, 2019 [3] provided a bibliometric analysis of *International Journal of Strategic Property Management (IJSPM)*:

<https://journals.vgtu.lt/index.php/IJSPM/index>

<https://journals.vgtu.lt/index.php/IJSPM/article/view/10535/9324>

Being established in 1997, the IJSPM is an interdisciplinary journal which provides a forum for a broad range of strategic property management research. The topics such as the asset and facilities management, the property policy, the risk management, the residential property value enhancement, and the housing finance are included in the scope of the IJSPM's investigation. This journal is referred in the Social Science Citation Index (SSCI) database, with an impact factor of 1.639 according to the Journal Citation Report (2019).

The research [3] founded that the articles published in 2017 have been cited most frequently, while there are more papers released in the IJSPM in 2018. China, Lithuania, England, Australia, and the USA are the most productive countries. In terms of the institutions that have contributed a lot in this area, Vilnius Gediminas Technical University is the most productive and influential organization. As for the cited journal with citation burst, they have been constantly attracted the attention from the articles published in the IJSPM between 2008 and 2019. The strongest citation bursts of The Review of Economics and Statistics and Regional Science and Urban Economics

continue until now. In consideration of the hot topics and the emerging trends in this research area, the keyword of “model” appeared most frequently. Hui has 21 publications in the IJSPM, he is the most productive author. Kaklauskas, as a cited author, has received the longest duration of citation burst which began in 2009 and ended in 2013 years.

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The paper of Xu, Zhou and Baltrėnaitė, 2019 [4] provided a bibliometric analysis of ***Journal of Environmental Engineering and Landscape Management (JEELM)***:

<https://journals.vgtu.lt/index.php/JEELM>

<https://journals.vgtu.lt/index.php/JEELM/article/view/11366/9502>

JEELM makes some contributions to the research of environmental changes caused by human activities and the sustainability-related investigations. As a research journal, JEELM is acknowledged by The Lithuanian Academy of Sciences, The International Academy of Ecological and Life Protection Sciences (IAELPS) and is also the associate member of the Public Information Department of the United Nations. JEELM is indexed by Clarivate Analytics Web of Science and the latest Journal Impact factor IF = 2.733, its quartile in the category of environmental sciences is Q2 (data from the 2019 edition of Journal Citation Reports).

The findings are concluded as follows [4]: The number of publications reached the peak in 2010. Besides, the article entitled “Sustainable construction taking into account the building impact on the environment” (Medineckienė et al., 2010) is the most influential paper with 67 citations. Lithuania is the most influential country. As the publishing institution, Vilnius Gediminas Technical University is the most influential institution. As the former Editor-in-Chief, Baltrėnas is the most influential author. As for the analysis of keywords, the keywords “heavy metal”, “soil”, “plant”, “nitrogen”, “water”, and “impact” occur in JEELM frequently. In the cluster network of keyword research of JEELM, the biggest cluster is “waste management scenario”. Moreover, from the timeline view of keywords, it has been derived that people begin to care more about how to restore ecology instead of investigating and studying the detailed information of pollution sources before.

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The paper of Zhou, Xu and Skačkauskas, 2019 [5] provided a bibliometric analysis of ***TRANSPORT***:

<https://journals.vgtu.lt/index.php/Transport>

<https://journals.vgtu.lt/index.php/Transport/article/view/11774/9612>

The journal focuses on many issues related to transport, such as transport policy, transport system, transport tools, transport economics and management, transport educology and history, etc. The first issue of this journal was published (under the new title) in 2002. This journal was indexed in Clarivate Analytics Web of Science in 2007. Now, TRANSPORT is indexed in many famous databases such as Science Citation Index Expanded (SCI-Expanded), Ei Compendex, and Scopus. In the SCI-Expanded database, this journal ranks 30/36 in the Transportation Science & Technology filed and belongs to a Q4 journal. In the Scopus database, this journal is classified as the Q2 journal.

According to the study [5] on the papers published in TRANSPORT and indexed in Clarivate Analytics Web of Science, it can be found that many papers were published in 2018 with a large number of citations. The paper “Multi-objective decision-making for road design” (Brauers et al. 2008) is the most influential paper. As for the top 20 keywords with the strongest citation bursts, the keywords “automobile”, “network” and “efficiency” receive the longest burst durations. In 2007, the emerging trends of the research outputs in this journal can be related to automobile, which is a commonly used transport way in people’s daily life. In recent years, the emerging trends of this journal tend to be “design” and “public transport”, indicating that technological innovations and public awareness have also attracted researchers’ attention. In terms of the keyword’s analysis, “model” and “system” have occurred the most. In the keyword cluster network, the

authors have found that “operational parameter” is the biggest cluster. Finally, from the timeline view analysis it can be seen that the hot topics of this journal continually change over time and the authors pay more attention to transport service recently.

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The Baltic Journal of Road and Bridge Engineering (BJRBE) was transferred from Vilnius Gediminas Technical University (Lithuania) to Riga Technical University (Latvia) since June 2018: <https://bjrbe-journals.rtu.lv/index>

The study of Zhou, Xu, Zavadskas and Laurinavičius, 2020 [6] presented a bibliometric analysis on the BJRBE publications 2006-2019:

<https://bjrbe-journals.rtu.lv/article/view/bjrbe.2020-15.470/pdf>

Being established in 2006, The Baltic Journal of Road and Bridge Engineering (BJRBE) provides a platform for researchers who are interested in the areas such as the road and bridge research and design, the construction materials and technologies of roads and bridges, the construction financing and environmental issues, and the assessment management. This journal is collected in the Social Science Index Expanded and ranked 123rd among 134 journals in the research area of civil engineering with an impact factor of 0.62 in 2019 based on the Journal Citation Report.

The analysis [6] showed that the articles published in 2010 have been cited most frequently. “Multi-attribute assessment of road design solutions by using the COPRAS method” published in 2007 by Zavadskas, Kaklauskas, Peldschus, & Turskis is the most cited paper in BJRBE. Lithuania, Poland, and Italy are the countries published most articles, and among the top 10 influential countries, most countries are from Northern Europe. Lithuania has more connections with other countries. As the agency for publishing the Baltic Journal of Road and Bridge Engineering, the Vilnius Gediminas Technical University is the most influential organization that published most papers. Čygas has most collaborations with other authors. The top 18 cited journals of the Baltic Journal of Road and Bridge Engineering have listed with the strongest citation bursts between 2006 and 2019, and Journal of Civil Engineering and Management and Transport and Procedia Engineering have the most extended duration. The strongest citation bursts of Procedia Engineering, Structure and Infrastructure Engineering, Journal of Performance of Constructed Facilities, Transportation Research Procedia, and Thesis continue until 2019. Besides, Laurinavičius is the most productive author who has 28 publications in the Baltic Journal of Road and Bridge Engineering. Petkevičius, Radziszewski, Zavadskas, & O’Brien have the most extended duration of citation burst.

The keywords are analysed to learn hot topics and the emerging trends of the research field of BJRBE [6]. The most significant cluster of the main keyword is “stray current corrosion” and the keyword of “model” appears most frequently, it shows the hot topics and emerging trends of this journal recently. In addition, based on the timeline of keywords, it is found that the hot keywords “accident criteria”, “traffic accident”, “tire and road noise”, and “creep risk” have been changed into “cost”, “sustainability”, and “reliability”. They have gained increasing attention from the scholars in the journal and this research field.

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Also, we would like to take an opportunity and to mention the Journal **Computer-Aided Civil and Infrastructure Engineering (CACAIIE)** on the occasion of its 35th anniversary.

<https://onlinelibrary.wiley.com/journal/14678667>

Professor Edmundas Kazimieras Zavadskas was one of the scientists who received a letter from Professor Hojjat Adeli, Editor-in-Chief of CACAIIE, to write an editorial for the 35th anniversary of the journal [7]:

<https://onlinelibrary.wiley.com/doi/epdf/10.1111/mice.12597>

CACAIE has been a leader in Journal Citation Reports (JCR) category rankings in the areas of Civil Engineering, Construction & Building Technology, Transportation Science & Technology, Computer Science, and Interdisciplinary Applications for many years. In Clarivate Analytics Web of Science this journal is classified as the Q1 journal with the Impact Factor of 8.552.

CACAIE has elevated the profile of the entire civil engineering field in bibliometrics. Over a long period of 35 years, Editor-in-Chief Hojjat Adeli has been instrumental in transforming the image of Civil Engineering from a low-tech field to an exciting field where high technology and advanced computing ideas are embraced. The process of reviewing and publishing papers in CACAIE and the experience gained has contributed to improving the quality of VILNIUS TECH journals, such as the Journal of Civil Engineering and Management, Technological and Economic Development of Economy, and International Journal of Strategic Property Management [7].

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Researchers from VILNIUS TECH serve as Guest Editors in many other scientific journals and publish Special Issues on the topics related to our Working Group activities.

Symmetry is one of the journals that has published the most numerous collections of Special Issues edited by our Working Group members:

https://www.mdpi.com/journal/symmetry/special_issues/Civil_Engineering_Symmetry
https://www.mdpi.com/journal/symmetry/special_issues/Solution_models_based_symmetric_asymmetric_information
https://www.mdpi.com/journal/symmetry/special_issues/Sustainability_Engineering_Processes
https://www.mdpi.com/journal/symmetry/special_issues/Symmetric_Asymmetric_Data_Solution_Models

https://www.mdpi.com/journal/symmetry/special_issues/Sustainability_assessment_globalization
Therefore, in 2020 Li, Xu, Zavadskas, Antucheviciene and Turskis [8] published a bibliometric analysis of Symmetry:

<https://www.mdpi.com/2073-8994/12/8/1304>

Symmetry is an international journal in the research fields of physics, chemistry, biology, mathematics, computer science, theory and methods, and other scientific disciplines and engineering with an impact factor of 2.645 by Journal Citation Reports (2019). The first paper was published in 2009, therefore a bibliometric analysis of publications in Symmetry from 2009 to 2019 has been made that included 3215 papers. The analysis was conducted from the following aspects: basic characteristics, including the publications, citation number and citation structure; the influential objects; co-citation contributors and the burst detection analyses; the author-keywords co-occurrence analyses and timeline view analysis. The analysis [8] showed that the number of publications has almost increased every year since 2014. The year 2019 was the year with the largest volume of publications and 2018 was the year with the most citations. The prominent author is Smarandache F. According to the results, cooperation among contributors also plays a key role in the publications. In the view of author-keyword analyses, the scopes of Symmetry are constantly enriching and no longer limited to the symmetry phenomena in the fields of physics and chemistry. At present, these include decision making, fuzzy mathematics, deep learning, machine learning and classification.

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