

Int. J. Advance Soft Compu. Appl, Vol. 14, No. 2, July 2022
Print ISSN: 2710-1274, Online ISSN: 2074-8523
Copyright © Al-Zaytoonah University of Jordan (ZUJ)

A bibliometric analysis of the International Journal of Advances in Soft Computing and its Applications: Research influence and Contributions

Yousef Jaradat¹, Mohammad Alia², Mohammad Masoud³, Ahmad Manasrah⁴, Iqbal Jebreil⁵, Alaa⁷ Garaibeh⁶ and Sarah Al-Arasi⁷

^{1,3}Electrical Engineering, ²Computer Science, ⁴Mechanical Engineering, ⁵Department of Mathematics, ⁶Department of Arabic Language, ⁷Department of Law, Al-Zaytoonah University of Jordan
e-mail:y.jaradat@zuj.edu.jo

Abstract

The International Journal of Advances in Soft Computing and its Applications (IJASCA) is a rapidly growing academic journal published by Al-Zaytoonah University of Jordan (ZUJ). IJASCA publishes original contributions on soft computing, machine learning and artificial intelligence, cloud computing, big data and other current science and technological trends. This study uses different bibliometric analysis tools to analyze the IJASCA published research papers between 2009 and 2021. The analysis includes annual publication growth, citation patterns, most prolific authors, institutions and countries, co-citation and co-occurrence networks analysis. A total of 317 published papers have been studied. The results show that IJASCA has grown in research contributions from 12 papers in 2009 to 40 papers in 2021, and citations have grown drastically to 2253. Universiti Teknologi Malaysia, Johor, is the institution that contributed the most to IJASCA publications with 109 papers. Malaysia is the country that was cited the most with 794 citations. Thematic analysis shows that the most important author keywords are soft computing, optimization, machine learning, big data and cloud computing. Overall, the findings are beneficial to the IJASCA editorial board. Its retrospective review will most likely encourage journal readers and assist the editorial team in developing research strategies that will allow research scientists to contribute high-quality research papers to the IJASCA.

Keywords: *IJASCA, Bibliometric analysis, co-citation analysis, co-occurrence analysis, thematic analysis, Scopus*

1 Introduction

The International Journal of Advances in Soft Computing and its Applications (IJASCA) is now an internationally recognized and respected double-blind peer-reviewed academic journal. IJASCA was established in 2007 by the International Center for Scientific Research and Studies (ICSRS) which is a center for academic and publishing services. Scopus included IJASCA in its database in 2009. Based on a mutual agreement with the ICSRS, Al-Zaytoonah University of Jordan (ZUJ) became the publisher of the IJASCA in 2020. IJASCA publishes papers on soft computing and its applications in science and engineering. Soft computing, as opposed to traditional computing, works with approximate models to solve complex real-world problems. Soft computing, unlike hard computing, can tolerate uncertainty, imprecision, approximations, and partial truth [1]. Fuzzy logic and control [2], genetic algorithms [3], optimization methods, artificial neural networks, machine learning [4], and expert systems [5] are all examples of soft computing techniques. IJASCA accepts two types of documents in the field of soft computing: papers and reviews.

IJASCA has now a Scopus CiteScore of 1.9, placing it 487 out of 747 titles in the Soft Computing category. According to the CiteScore, articles published in IJASCA between 2018 and 2021 received an average of 1.9 citations in 2021. SCImago Journal Rank (SJR) of 0.24, and Source Normalized Impact per Paper (SNIP) of 0.685 are currently assigned to the journal. SNIP denotes that IJASCA publications have received an average of 0.685 citations from journals in its own subject discipline.

Bibliometric analysis is a common and comprehensive method for exploring and evaluating large amounts of published scientific data. Bibliometric analysis employs statistical tools to examine published academic studies, including several descriptive statistics of citation data, as well as network analysis of authors, journals, universities, countries, and keywords based on citations and frequency analysis techniques [6]. It aids in the identification of research clusters, reveals trends for emerging topics in a field, and provides insights into current research interests [7]. Moreover, Bibliometric studies have also grown in popularity as a method of investigating a journal's intellectual structure in terms of publications, contributions, and influence [8]. In this manner, by utilizing a variety of bibliometric tools, this research attempts to provide an in-depth picture of IJASCA in terms of topics, authors, and the impact of its published papers.

This paper provides the following contributions. First, it examines the contributions of research constituents in the IJASCA. The research constituents include authors, institutions, and countries. The most visible measures are the number of publications and citations per year or per research constituent, with publication serving as a proxy for productivity and citation serving as a measure of influence [9]. Other metrics include citations per publication and the h-index, which combine citations and publications to assess the performance of research

constituents. Second, it investigates the connections between research constituents. The investigation focuses on the intellectual interactions and structural connections between research constituents [10]. Citation analysis [11], bibliographic coupling, co-citation analysis, co-word analysis, and co-authorship analysis are used to reveal the connections between research constituents. Third, it provides the necessary information for the editorial board to make decisions that will aid in improving the IJASCA and keeping it competitive with other journals, as well as emphasizing the IJASCA's strong points and processing its weaknesses.

The remainder of the paper is structured as follows. Section 2 contains a bibliography of related literature. The third section provides an overview of the bibliometric analysis and methodology. The bibliometric results are explained in Section 4. Section 5 contains the conclusion and future research.

2 Related Work

Bibliometric analysis was introduced in 1969 [12], and it was defined as the mathematical and statistical method applied to books and other forms of communication. The definition of the bibliometric analysis was extended in 2001 [13] as “the quantitative analysis of the bibliographic features of a body of literature”. The goal of bibliometric analysis is to discover patterns in the literature, such as the most prolific authors, journals, institutions, and countries within a particular scientific discipline. The goal is also to discover trends in literature production over time, collaboration networks among authors, institutions and countries, the history and structure of a field, the flow of information into a field, the impact of journals, and the long-term citation impact of publications [14,15]. Bibliometric analysis can be performed on any research constituent or scientific discipline.

Scientific discipline bibliometric Analyses (SDBA) are the most common. SDBA studies that track the history, structure and information flow of a particular discipline or sub-discipline. Frequently, SDBA studies identify hot topics in certain field through the volume of publication, and the influence of these publications through citations. A number of SDBA studies in the field of soft computing are reviewed. In [16] the authors have conducted a systematic review of 312 research documents published in Scopus-indexed journals between 2000 and 2020 in the field of textile and clothing supply chain. A bibliometric analysis revealed a significant increase in the number of studies since 2015. According to keyword and thematic content analyses, operations related to yarn and fabric manufacturing and quality control benefit the most from machine learning (ML) techniques. In terms of ML and soft computing (SC) techniques, however, artificial neural networks (ANN), genetic algorithms (GA), and fuzzy logic outnumber the others. Further, the authors in [17] have studied the applications of big data, soft computing, and artificial intelligence (AI) in the maritime industry. They analyzed 279 articles and identified the most influential articles, journals,

authors, and institutions using citation analysis metrics. Moreover, they identified four underlying research clusters using the bibliographic coupling methodology: digital transformation in the maritime industry, applications of big data from automatic identification system, energy efficiency, and predictive analytics. They thoroughly examined these clusters and derived future research questions. SDBA studies can span all fields of science. For example, they can be found in economy [18], healthcare [19, 20], and engineering [21, 22].

In contrast, research constituent bibliometric analysis (RCBA) can be performed on any research constituent (institutions, journals or sources and authors). We will concentrate on journal-based RCBA in this study. The authors in [23] have analyzed the publications on the Arabian Journal for Science and Engineering (AJSE) during the period between 1977 and 2021. Their findings showed that AJSE's total publications and citations increased noticeably between 1977 and 2021, reaching 7658 papers and 33,846 citations. India has contributed the greatest number of papers. King Fahd University of Petroleum and Minerals was discovered to be the most active contributor to AJSE publications. Zhang L. was identified as the most prolific author. Optimization, adsorption, genetic algorithms, and mechanical properties are the most important author keywords. Saudi Arabia and Egypt collaborated on the most AJSE research papers. In [24] the authors have studied and analyzed 3680 publications by the Journal of Applied Soft Computing (ASOC) during the period between 2004 and 2016. They showed that ASOC had the highest number of papers published in 2015 and the highest total citations in 2011. Four papers received more than 200 citations each, while 15% of papers are still uncited. Moreover, they identified genetic algorithm (GA), particle swarm optimization (PSO), and Multi-Objective Optimization (MOO) to be the top research areas in ASOC over the last five years. A total of 537 publications of the Journal of Hospitality and Tourism Management (JHTM) were analyzed during the period between 2006 and 2020. The authors have identified University of Queensland to be the top contributing institution with 6.7% of the total JHTM publications, and Australia to be the top contributing country with 29.05% of the total JHTM publication. Furthermore, the authors discovered four thematic clusters that provide useful insights into the themes emerging from JHTM publications over time. The clusters are: Sustainability and responsible tourism, Work-family conflict and organizational support, Tourism experiences and service quality, and Hospitality management skills.

3 The bibliometric analysis workflow

Bibliometric analysis is a research technique that is commonly used in the field of information and library science studies and employs statistical tools to analyze published academic studies. Moreover, bibliometric analysis involves several summary statistics of citation data, as well as network analysis of journals, authors, institutions, countries, and keywords based on citations and frequency analysis methods. It aids in the identification and understanding of research

clusters and groups, provides insights into current research hot topics, and reveals trends and patterns for emerging topics in a field [17]. A typical workflow of any bibliometric study includes:

1. Data collection through literature search of biography data from renowned database such as Web of Science (WoS), Scopus, Dimensions, and others
2. Bibliometric Analysis is divided into two parts: performance analysis and science mapping [7]. The process of examining the contributions of research constituents to a specific field is referred to as performance analysis. These include metrics for publication and citation. The process of examining the relationships between research constituents is referred to as science mapping. Co-citation analysis, bibliometric coupling, co-word analysis, and co-authorship analysis are examples of such.
3. Results and findings

On June 6, 2022, the data collection phase began at ZUJ in Amman, Jordan. The Scopus database returned 317 documents in response to the search query of IJASCA. In the analysis, Biblioshiny [26], VOSviewer [27], and Microsoft Excel were used.

4 Results of the bibliometric analysis

Table 1 shows important summary statistics of IJASCA. A total number of 317 documents (i.e., 313 article papers, and 4 review papers) were contributed by 717 authors and were cited 2253 times. Among the 717 authors, 17 have authored single-authored documents, while 700 have authored multi-authored documents. The IJASCA collaboration index (CI) is 2.33 which implies that around two to three authors collaborate to produce a research paper in multi-authored documents. Moreover, on average, an author appears 1.33 times (AUA/AU) on a research paper. IJASCA research papers contributed to an average of 7.11 citations (TC/TP) during the period between 2009 and 2021. The total references used in the IJASCA dataset were 8766 with an average of 27.65 references (REF/TP) per document. The total number of author's keywords (DE) was 1238 with an average of 3.91 keywords (DE/TP) per document. The keyword Plus (ID) is different from the author's keywords. Keyword Plus is automatically generated by the biography databases (WoS, Scopus, ...etc). It is usually generated from the title, abstract and body of the research paper. Moreover, it helps in finding research hot topics and documents' clustering. Scopus database refers to the keyword plus as indexed keywords. The IJASCA dataset has no keyword plus feature, and this should be fixed in the future to be consistent with other journals to extract different statistics and patterns from this important feature.

Table 1: IJASCA Statistics

Description	Results
Timespan	2009:2021
Documents or Total Publications (TP)	317
Article	313
Review	4
Total Citations (TC)	2253
References (REF)	8766
Keywords Plus (ID)	0
Author's Keywords (DE)	1238
Authors (AU)	717
Author Appearances (AUA)	959
Authors of single-authored documents (ASAD)	17
Authors of multi-authored documents (AMAD)	700
Single-authored documents (SAD)	17
Multi-authored documents (MAD = TP - SAD)	300
Documents per Author (DPA = TP/AU)	0.442
Authors per Document (APD = AU/TP)	2.26
Co-Authors per Documents (CAPD = AUA/TP)	3.03
Collaboration Index (CI = AMAD/MAD)	2.33

4.1 Annual Research Production

Table 2 shows IJASCA's annual production of research papers and their corresponding citations from 2009 to 2021. Since the inception of the IJASCA in 2009, the number of research paper publications has increased by more than threefold as of 2021. Most publications were published in 2021, with 40 documents, and the fewest were in 2012 with only six. During its first five years, IJASCA published 12.8 research papers per year on average; this average has increased to 31.625 over the last eight years, indicating a significant increase in scientific publications on the one hand, and the journal's popularity on the other.

Citation analysis reveals that IJASCA has produced 2253 cumulative total citations (CTC) from 317 cumulative total publications (CTP). This means that between 2009 and 2021, each publication contributed an average of 7.11 citations. The total cited publications (TCP) figure represents the number of research papers that were cited. There was a total of 257 research papers that contributed to IJASCA citations. Between 2009 and 2021, a total of 60 research papers were not cited which represents 18.9% of CTP. However, 81% of all publications were cited. As a result, these publications generated an average of 8.77 citations per paper. The publications from 2013 and 2015 have the highest percentages of the CTC (18%). However, the TC/TP ratio in 2013 is 27.6, which is significantly higher than the 12.91 ratio in 2015. This makes 2013 publications more influential

and had the greatest impact. These analyses show that IJASCA publications and citations have increased dramatically since its inception, with citations growing significantly faster than publication, which is very encouraging. Figure 1 shows the annual publications and citations for the IJASCA according to the citable years (CY). Figure 2 shows the annual publications and citations for the IJASCA according to progressive years over the period 2009-2021. The figure shows zero total citation per year (TCPY) on 2009 and then TCPY started to grow in the following years. A TCPY of 216 is observed between the beginning of the year 2021 and June 6, 2021, the date on which the Scopus data is obtained.

Table 2: IJASCA annual publications and citations during between 2009-2021

Year	TP	CTP	TC	CTC	TCP	TC/TP	%TC	CY
2009	12	12	189	189	12	15.75	8%	13
2010	18	30	239	428	17	13.28	11%	12
2011	13	43	220	648	13	16.92	10%	11
2012	6	49	49	697	4	8.17	2%	10
2013	15	64	414	1111	13	27.60	18%	9
2014	33	97	162	1273	29	4.91	7%	8
2015	32	129	413	1686	28	12.91	18%	7
2016	33	162	128	1814	27	3.88	6%	6
2017	33	195	107	1921	26	3.24	5%	5
2018	33	228	115	2036	24	3.48	5%	4
2019	30	258	72	2108	25	2.4	3%	3
2020	19	277	101	2209	13	5.32	4%	2
2021	40	317	44	2253	26	1.1	2%	1
Total	317		2253		257		100%	

*CTP: cumulative total publications, CTC: cumulative total citations, TCP: Total cited publication, CY: citable years

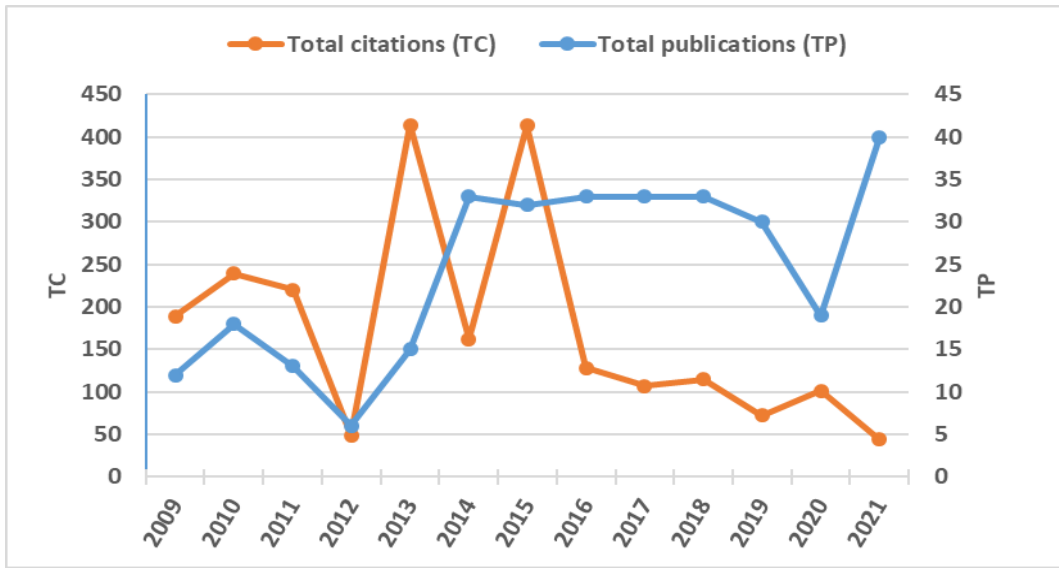


Figure 1 Annual growth of the IJASCA publications and citations per citable years.

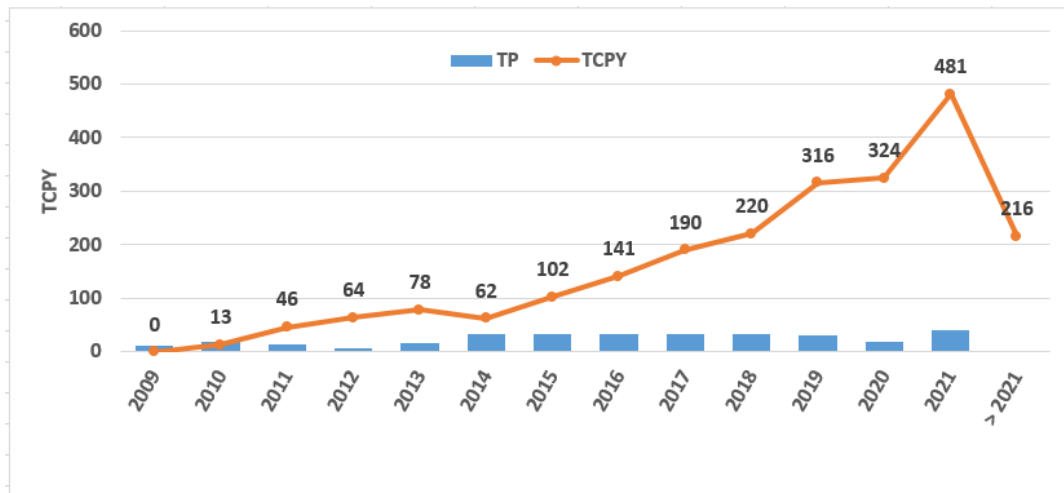


Figure 2 Annual growth of the IJASCA publications and citations per year

4.2 Top contributing research constituents: Authors, institutions, and countries

The total number of authors who contributed to IJASCA publications is 717, as shown in Table 1, and these authors appeared 959 times in the publications. The top ten most prolific authors of IJASCA research papers published between 2009 and 2021 are shown in Table 3. These authors wrote anywhere from 5 to 31 research papers. Shamsuddin SM has the most

contributions as an author in IJASCA research papers, with 31 papers published and 744 citations. Shamsuddin SM's h-index is 9, his g-index is 27, and his m-index is 0.643. The h-index takes into account the number of publications as well as the number of citations per publication. The g-index considers the overall record of citations from higher-cited articles to be used to bolster lower-cited articles; it is always greater or equal to the h-index. The m-index shows the h-index per year since first publication. The m-index is useful for comparing researchers with very different career lengths within a field [23, 24]. The top 10 authors have contributed to at most 89 papers which represent 28% of the total number of publications. Eight of the top 10 authors are Malaysians, with six affiliated with Universiti Teknologi Malaysia (UTM), Johor, and two with Universiti Teknologi Mara, Penang. The other two authors were from Indonesia and are affiliated with the Brawijaya University.

Figure 3 shows the IJASCA top 10 most cited authors between 2009-2021. Shamsuddin SM is the most cited author, followed by Beheshti Z with 272 citations with 3 published articles.

Table 3: IJASCA top 10 most prolific authors

Rank	Author	Affiliation	Country	TP	TC	h-index	g-index	m-index
1	Shamsuddin SM	Universiti Teknologi Malaysia, Johor	Malaysia	31	744	9	27	0.643
2	Hasan S.	Universiti Teknologi Malaysia, Johor	Malaysia	11	40	4	5	0.308
3	Sulaiman S	Universiti Teknologi Malaysia, Johor	Malaysia	9	33	3	5	0.3
4	Sjarif NNA	Universiti Teknologi Malaysia Kuala Lumpur	Malaysia	7	44	3	5	0.273
5	Hashim SZM	Universiti Teknologi Malaysia, Johor	Malaysia	6	90	4	5	0.286
6	Abdullah SAC	Universiti Teknologi Mara, Penang	Malaysia	5	13	2	3	0.222
7	Ali A	Universiti Teknologi Malaysia, Johor	Malaysia	5	232	3	4	0.375
8	Soh ZHC	Universiti Teknologi Mara, Penang	Malaysia	5	13	2	3	0.222
9	Tolle H	Brawijaya University	Indonesia	5	10	3	3	0.429
10	Utamingrum F	Brawijaya University	Indonesia	5	19	3	4	0.5

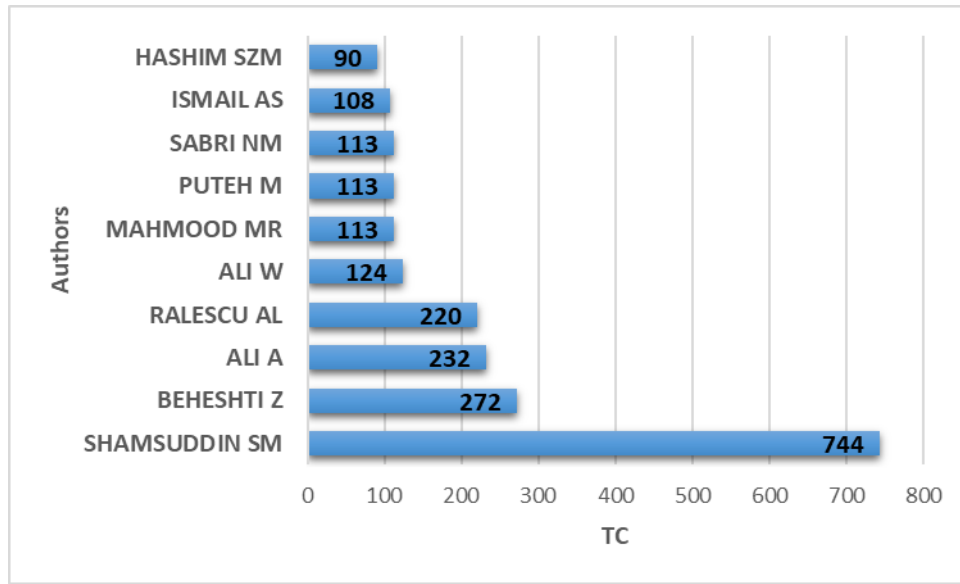


Figure 3 IJASCA top 10 most cited authors between 2009-2021

Figure 4 shows the 10 most contributing institutions on IJASCA between 2009-2021. It is obvious that the Universiti Teknologi Malaysia has the highest number of article (TP = 109), which contributed to 34% of the total publications. Al-Zaytoonah University of Jordan (ZUJ) ranked the second with 18 articles. The contribution of other Jordanian institutions to IJASCA publication is weak, which indicates a low visibility of the journal in Jordan.

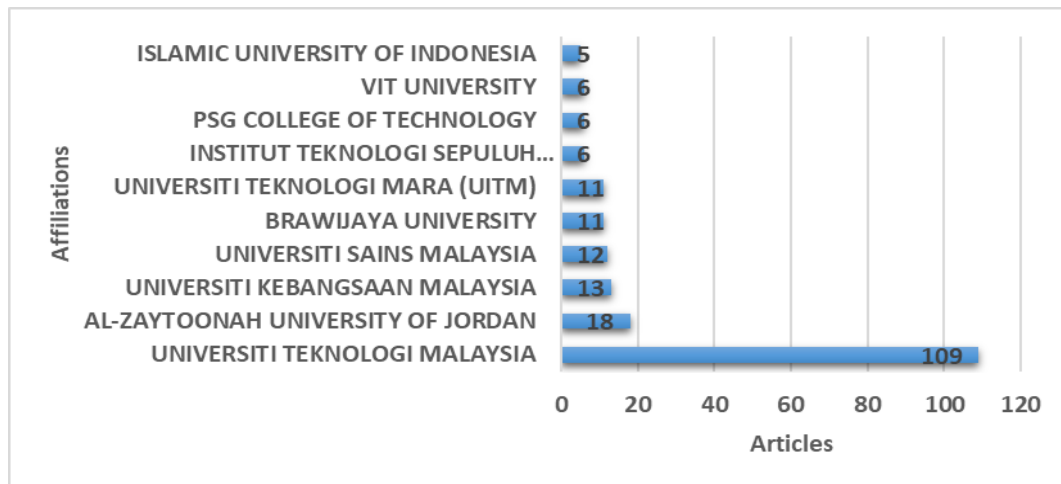


Figure 4 IJASCA top 10 most prolific institutions between 2009-2021

Figure 5 depicts the impact of IJASCA publications in terms of country citations from 2009 to 2021. Malaysia is the most cited country, with 794

citations, followed by India, with 329 citations. Jordan was ranked fifth with 20 citations, indicating that articles in IJASCA produced by Jordanian authors have low visibility to others or that the topics of those articles are not considered trends or important topics.

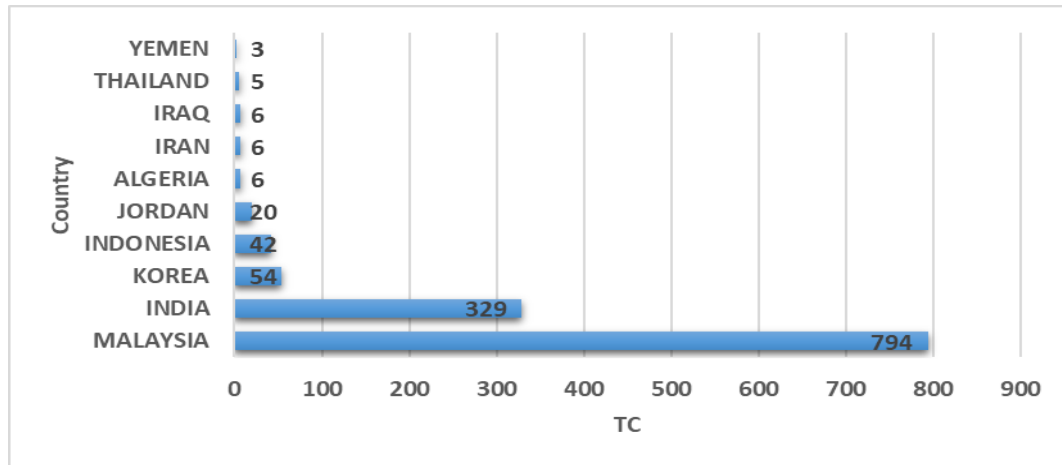


Figure 5 IJASCA top 10 most cited countries between 2009-2021

4.3 Science mapping of research constituents

Science mapping investigates the relationships between research constituents, and it is concerned with the intellectual interactions and structural connections that exists between research constituents. Co-citation analysis, bibliographic coupling, co-word analysis and co-authorship analysis are some of the techniques used in science mapping [3].

4.3.1 Co-citation analysis of most cited sources in IJASCA

Co-citation analysis assumes that research constituents that are cited together are thematically the same. Moreover, it can be used to reveal the intellectual structure of a research field. For example, a co-citation analysis of sources means if journal A has cited two other journals B and C, then journals B and C are thematically similar. The co-citation network of the most cited sources by IJASCA is depicted in Figure 6. The VOSviewer software was used to create the figure. Only 57 of the 5635 sources meet the minimum of 10 citations for the analysis. The co-citation network consists of 57 sources, 6 clusters, 546 links, and total length strength of 3924. The six clusters are as follows. Cluster 1 (red) comprises of 25 cited sources, cluster 2 (green) with 12 cited sources, cluster 3 (blue) with 7 cited sources, cluster 4 (yellow) with 5 cited sources, cluster 5 (purple) with 4 cited sources, and cluster 6 with 3 cited sources.

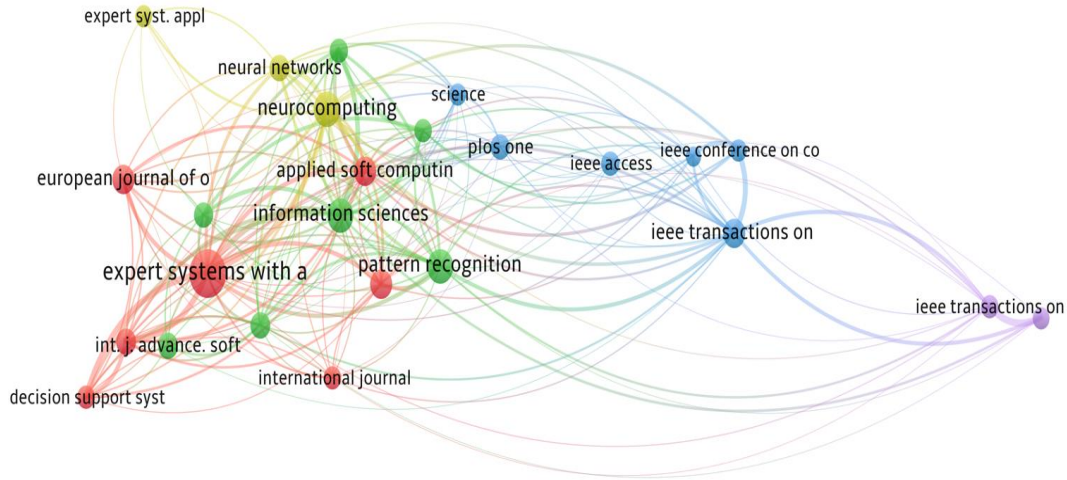


Figure 6 Co-citation network of cited sources in IJASCA between 2009-2021

4.3.2 Thematic analysis of IJASCA publications

To investigate the thematic structure of IJASCA publications, a co-occurrence network is used. The co-occurrence network is built using the keywords of the authors. Authors' keywords represent network nodes, node size indicates keyword occurrence, and the link between nodes indicates the number of times these keywords co-occur. We considered keywords with at least 5 occurrences. Out of 1237 keywords 17 keywords met the threshold. Figure 7 shows five different themes formed by author keywords. In general, these five theme clusters can be further reduced to four since one of the clusters (clustering) can be merged with the machine learning cluster.

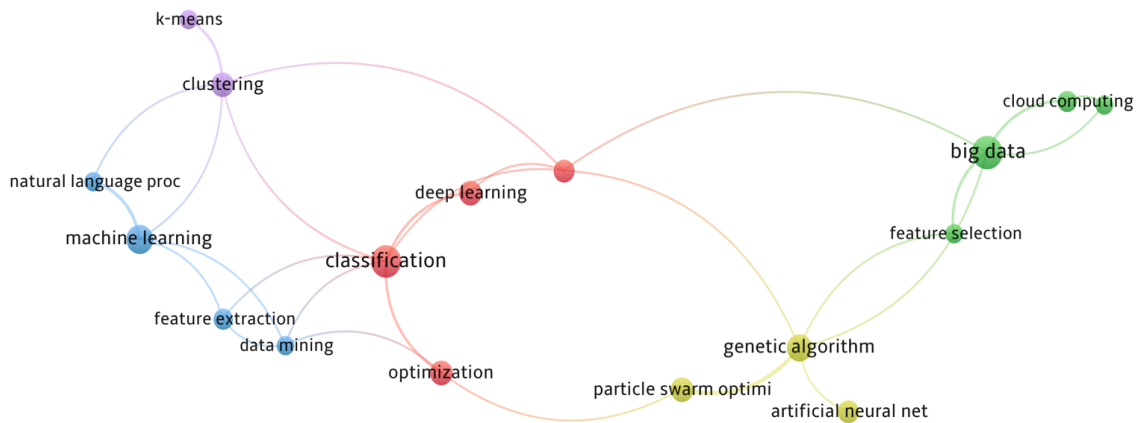


Figure 7 Co-occurrence network of IJASCA publications between 2009-2021

The four clusters are: feature engineering (selection and extraction), machine learning algorithms (specially classification and clustering algorithms),

optimization and big data, and cloud computing. The four topic themes are inter-related and can be used together almost always. Figure 8 shows the distribution of the IJASCA topic themes with their corresponding keywords occurrences.

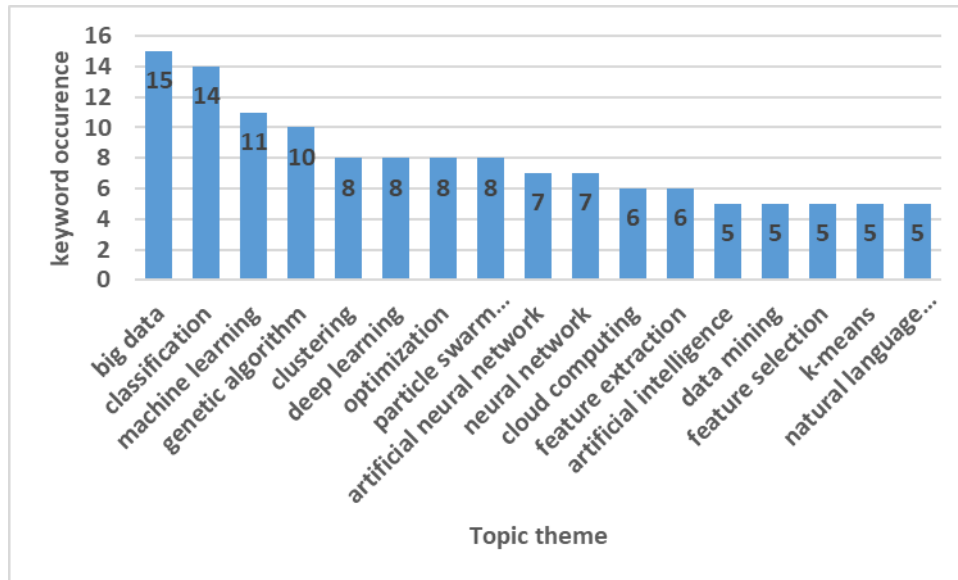


Figure 8 keywords occurrence by topic themes

Figure 9 depicts the IJASCA themes' temporal evolution between 2009 and 2021. The first time slice (2009-2013) demonstrates that two general themes (optimization and neural networks) were intensively studied; these two themes aligned with the IJASCA main theme of soft computing in general, as these two themes are at the heart of soft computing. In the following time slice (2014-2018), the basic theme of soft computing was expanded to include other important topics such as machine learning, big data, and cloud computing. The trend topics of machine learning and classification, big data, and deep learning dominated the publications in the final time slice (2019-2021), as these are considered hot research topics.

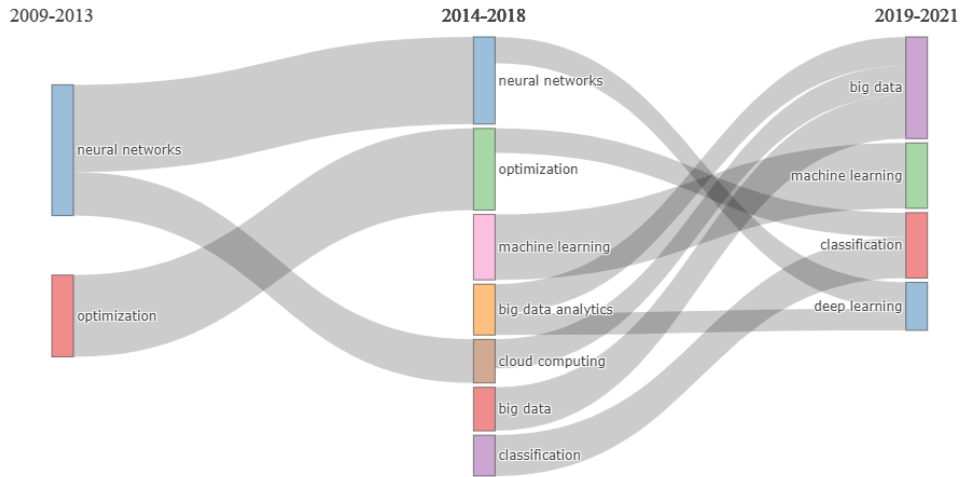


Figure 9 Thematic evolution of IJASCA publications

Figure 10 shows the thematic map of the IJASCA publications between 2009 and 2021. The figure divided research topics into four types based on two factors; centrality and density. The degree of interaction that a keyword network has with other keyword networks is measured by centrality. Density measures a network's internal strength, or how closely these words are related to one another [25]. Based on centrality and density, we can divide the themes into four groups.

- *Niche themes*: highly specialized and peripheral topics
- *Motor themes*: important and well-developed research field structuring themes
- *Emerging or declining themes*: themes with low density and centrality represent emerging or declining themes.
- *Basic themes*: important research themes that have not yet been fully developed in the research field.

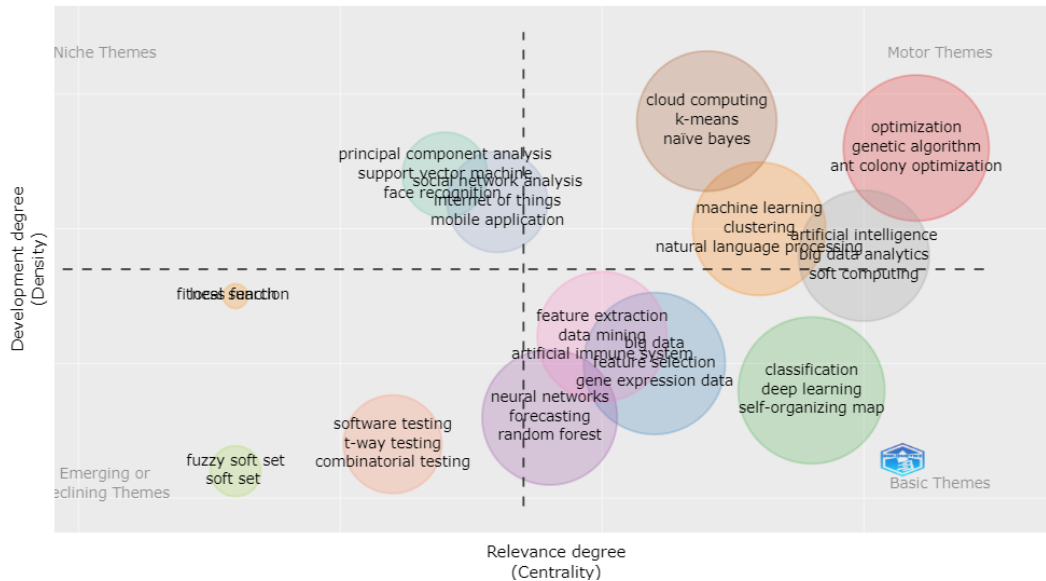


Figure 10 Thematic map of IJASCA publications

The niche themes in the upper left quadrant are depicted in the figure. Which are the research field's auxiliary and specific topics? Principle component analysis, support vector machines, and face recognition are some of the topics covered. The motor themes are located in the upper right quadrant. Optimization, (particularly genetic algorithms and ant colony optimization), cloud computing and associated machine learning algorithms (applied to data in the cloud), machine learning types and algorithms, and applying artificial intelligence techniques to big data are some of the topics covered. These are well-developed research topics. The topics in the emerging and declining quadrant are software testing, fitness function, local search and fuzzy sets which are declining topics in IJASCA publications. The basic themes are depicted in the lower right quadrant. These are fundamental and cross-cutting themes in the research field. These include deep learning, feature engineering, data mining, and neural networks for forecasting.

5 Conclusion

The bibliometric analysis of IJASCA scientific research between 2009 and 2021 shows that this journal has steadily increased in terms of publications and citations. In the last 13 years, IJASCA has grown from 12 papers in 2009 to 40 by 2021, becoming an important academic publishing outlet. Overall, the findings of this study provide useful information to the IJASCA editorial board and the academic community in developing research objectives and strategies in scientific and technological developments.

The IJASCA has established itself as a highly regarded publication outlet in soft computing and current technologies, and its reputation among general researchers is growing. To maintain this distinction, the IJASCA should broaden its publication sources and themes. The IJASCA needed to keep identifying and procuring research papers from prominent researchers around the world in a variety of contemporary and innovative research fields. Future initiatives would seek to strengthen the journal's international reputation by soliciting review articles and special issues on emerging scientific and engineering topics.

ACKNOWLEDGEMENTS

This research was supported by Al-Zaytoonah University of Jordan fund. Project number 37 / 06 / 2021-2022

References

- [1] Ibrahim, D. (2016). An overview of soft computing. *Procedia Computer Science*, 102, 34-38.
- [2] Masoud, M., Jaradat, Y., Manasrah, A., Taleb, B., Designing of a General Purpose Soft Programmable Logic Controller (PLC) for the Internet of Things (IoT) Era, (2020) *International Review of Automatic Control (IREACO)*, 13 (4), pp. 153-161. doi:<https://doi.org/10.15866/ireaco.v13i4.19328>
- [3] Jaradat, Y., Masoud, M., Jannoud, I., & Zeidan, D. (2022) Genetic Algorithm Energy Optimization in 3D WSNs with Different Node Distributions. *MDPI*
- [2] Masoud, M., Jaradat, Y., Manasrah, A., & Jannoud, I. (2019). Sensors of smart devices in the internet of everything (IoE) era: big opportunities and massive doubts. *Journal of Sensors*, 2019.
- [2] Liang, T. P., & Liu, Y. H. (2018). Research landscape of business intelligence and big data analytics: A bibliometrics study. *Expert Systems with Applications*, 111, 2-10.
- [3] Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133, 285-296.
- [4] Muhuri, P. K., Shukla, A. K., Janmajaya, M., & Basu, A. (2018). Applied soft computing: A bibliometric analysis of the publications and citations during (2004–2016). *Applied Soft Computing*, 69, 381-392.
- [5] Masoud, M. Z., Jaradat, Y., & Alia, M. (2022). IEEE802. 11 Access Point's Service Set Identifier (SSID) for Localization and Tracking. *CMC-COMPUTERS MATERIALS & CONTINUA*, 71(3), 5459-5476.

- [6] Donthu, N., Reinartz, W., Kumar, S., & Pattnaik, D. (2021). A retrospective review of the first 35 years of the International Journal of Research in Marketing. *International Journal of Research in Marketing*, 38(1), 232-269.
- [7] Baker, H. K., Kumar, S., & Pandey, N. (2021). Forty years of the journal of futures markets: a bibliometric overview. *Journal of Futures Markets*, 41(7), 1027-1054.
- [8] Pritchard, A. (1969). Statistical bibliography or bibliometrics. *Journal of documentation*, 25, 348.
- [9] Hawkins, D. T. (2001). Bibliometrics of electronic journals in information science. *Information Research*, 7(1), 7-1.
- [10] De Bellis, N. (2009). *Bibliometrics and citation analysis: from the science citation index to cybermetrics*. scarecrow press.
- [11] Jannoud, I. A., & Masoud, M. Z. (2015). On understanding centrality in directed citation graph. In *Advanced Computer and Communication Engineering Technology* (pp. 43-51). Springer, Cham.
- [12] Garfield, E. (2006). The history and meaning of the journal impact factor. *jama*, 295(1), 90-93.
- [13] Arora, S., & Majumdar, A. (2022). Machine learning and soft computing applications in textile and clothing supply chain: Bibliometric and network analyses to delineate future research agenda. *Expert Systems with Applications*, 117000.
- [14] Munim, Z. H., Dushenko, M., Jimenez, V. J., Shakil, M. H., & Imset, M. (2020). Big data and artificial intelligence in the maritime industry: a bibliometric review and future research directions. *Maritime Policy & Management*, 47(5), 577-597.
- [15] Alsmadi, A. A. (2022). Green Economy: Bibliometric Analysis Approach. *International Journal of Energy Economics and Policy*, 12(2), 282 – 289.
- [16] Guo, Y., Hao, Z., Zhao, S., Gong, J., & Yang, F. (2020). Artificial intelligence in health care: bibliometric analysis. *Journal of Medical Internet Research*, 22(7), e18228.
- [17] Zhu, S., Liu, Y., Gu, Z., & Zhao, Y. (2021). A Bibliometric Analysis of Advanced Healthcare Materials: Research Trends of Biomaterials in Healthcare Application. *Advanced Healthcare Materials*, 10(10), 2002222.
- [18] Li, Z., Lu, J., Wang, G., Feng, L., Broo, D. G., & Kiritsis, D. (2021). A Bibliometric Analysis on Model-based Systems Engineering. In *2021 IEEE International Symposium on Systems Engineering (ISSE)* (pp. 1-8). IEEE.
- [19] Elango, B. (2018). A bibliometric analysis of literature on engineering research among BRIC countries. *Collection and Curation*, 38(1).

- [20] Rahaman, M., & Ansari, K. (2022). Forty Five Years of the Arabian Journal for Science and Engineering (AJSE): A Bibliometric Analysis. *Arabian Journal for Science and Engineering*, 1-18.
- [21] Muhuri, P. K., Shukla, A. K., Janmajaya, M., & Basu, A. (2018). Applied soft computing: A bibliometric analysis of the publications and citations during (2004–2016). *Applied Soft Computing*, 69, 381-392.
- [22] Sigala, M., Kumar, S., Donthu, N., Sureka, R., & Joshi, Y. (2021). A bibliometric overview of the Journal of Hospitality and Tourism Management: Research contributions and influence. *Journal of Hospitality and Tourism Management*, 47, 273-288.
- [23] Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of informetrics*, 11(4), 959-975.
- [24] Van Eck, N., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *scientometrics*, 84(2), 523-538.
- [25] Egghe, L. (2006). Theory and practise of the g-index. *Scientometrics*, 69(1), 131-152.
- [26] Bornmann, L., Mutz, R., & Daniel, H. D. (2008). Are there better indices for evaluation purposes than the h index? A comparison of nine different variants of the h index using data from biomedicine. *Journal of the American Society for Information Science and technology*, 59(5), 830-837.
- [27] Cobo, M. J., Martínez, M. Á., Gutiérrez-Salcedo, M., Fujita, H., & Herrera-Viedma, E. (2015). 25 years at knowledge-based systems: a bibliometric analysis. *Knowledge-based systems*, 80, 3-13.