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A Comprehensive Bibliometric Analysis of Cybersecurity Trends on Cloud Computing

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Abstract

COVID-19 has significantly accelerated the adoption of cloud computing solutions due to the lockdown and remote job requirements, which raised vulnerabilities in many cloud computing services. The aim of this review is to investigate the cybersecurity trends in cloud computing in the period after the COVID-19 pandemic. To summarize studies connecting cybersecurity trends in cloud computing PRISMA is used in this bibliometric analysis. Scopus was selected for its broad coverage and reputation as a scientific article analysis resource. A complete keyword search retrieval 36,509 publications in the database. After applying inclusion and exclusion criteria narrowed the findings to 1,905 relevant articles. The increase of cybersecurity in cloud computing papers since 2019 suggested a greater research focus on this field. The major publications list of organizations and governments that contribute to this issue illustrates an international effect. The review emphasizes the major research keywords and active prolific authors, indicating the multidisciplinary nature of cloud computing research. Cybersecurity is becoming more effected on cloud computing, as shown by the raise of publication numbers, a diverse variety of authors, and a focus on numerous subject areas and keywords. This displays how collaborative and diverse this sector's research is. The review recommends more study to improve the security of cloud computing services environment. Limiting and mitigating the impact of cybersecurity on cloud computing require enhancing techniques and raise awareness of best practice of cloud computing services.

Keywords: Cloud Computing, Network Security, Cybersecurity

Introduction

It is well-known that cloud computing is a crucial cornerstone of the digital era. Cloud computing has innovated the storage, processing, and application of information, facilitating the way that people retrieve information from anywhere and at any time, leading to flexibility in how people do work productivity higher efficiency and cut cost significantly. Nowadays

there is an increasing share of work that is requested to be completed from home. In the covid 19 pandemic. Cloud computing has a very prominent role to play in terms of promoting the digital economy, industrial structure upgrading, total employment, and transforming the nature of employment restructuring.

The common adoption of cloud computing enhances cybersecurity threats growing concern. Intrusion, data tampering and storage-related risks have been identified as major security threats to cloud computing services (Cremer et al., 2022). Misconfiguration, identity, lack of visibility, and unauthorized access are among the highest-ranked cloud threats. In the case of mismanagement, organizations can suffer from data breaches and leakage.

The rising reliance on cloud computing and the equivalent increase in cybersecurity threats, there is a crucial need for comprehensive analysis of cloud computing and cybersecurity trends, such analysis can assist identify potential vulnerabilities and enhance effective mitigation strategies (Berisha et al., 2022). Such as, cloud security currency management (CSPM) has emerged as a major trend, helping to detect and prevent cloud misconfigurations in businesses field to prevent data breaches and leaks, further, it can guide the development of new standards and regulations to protect important customer data. Thus, the aim of this bibliometric review was to provide responses to the following research questions.

- What is the distribution of Cybersecurity Trends on Cloud Computing in publications from the years 2017 to 2022?
- Which academic publications are most pertinent to the study of Cybersecurity Trends on Cloud Computing?
- Which nations have the most impact on analyzing Cybersecurity in the field of Cloud Computing research?
- Which educational institutions have made the most notable contributions to the study of cybersecurity threats in cloud computing?
- Which Authors have produced the most substantial contributions to the field of cybersecurity threats in cloud computing?
- Over the last six years, what have been the most prominent research terms concerning cybersecurity threats in cloud computing?

Methods

Research Design

This bibliometric study adheres to the structure of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) as outlined by PRISMA Group (Moher et al., 2009). The principal objective of this in-depth analysis was to comprehensively outline the research corpus that explores the analysis of cybersecurity vulnerabilities in cloud computing. This included a thorough review of the leading countries, academic institutions, publications, and authors who have contributed significantly to this domain. Furthermore, it pinpointed common trends and key terms pertinent to this area of research.

In addition to the PRISMA framework for bibliometric analysis, Vos Viewer was used extensively for data visualization and analysis purposes, in this study. Vos Viewer is a software tool specifically designed to facilitate the creation and management of bibliometric networks times. These sites include journals, books, researchers, and even private businesses. The basis for these websites were co-authors, citations, citations, and bibliographies. In this research,

Vos Viewer was instrumental in mapping and analyzing the complex networks that made up cloud computing research. It provided knowledge of connections between academic disciplines, identified the most influential journals, books, and authors, and visualized trends Through the software's interactive graphical user interface and the ability to manage datasets large handling facilitated comprehensive data analysis. These contributions to the analysis identified the most relevant developments and policies in cloud computing research. Using Vos Viewer, a comprehensive understanding of the global impact and research developments of cloud computing was gained through geographic strategic publishing and institutional and authorial collaborations.

Identification

- **Database Selection**

The review was conducted on December 17, 2023, with the Scopus database chosen as the primary database for this examination. The Scopus database was selected due to its prestigious reputation in the analysis of scientific papers.

- **Search Strings**

To ensure the retrieval of the studies selected, the researcher used exact key words, these keywords were "(Cloud Computing and cybersecurity)," for instance: TITLE-ABS-KEY (cloud AND computing AND security). Moreover, publication for the last six years was selected from 2017 to 2022. In addition, the subject area was limited to computer science. This review was Strictly limited to English language publications. Journals were the only source in this search.

Table 1
Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Cloud Computing and Security research area	Any other subjects were excluded.
2017 – 2022	All publications before 2017 were excluded. And 2023 publications were excluded.
English language	Any other languages
Articles	Thesis, conferences, books, book chapters blogs.
Journals	Any other source was excluded.

Screening and Selection

The primary keywords employed in this study were "Cloud Computing and Security", which initially yielded 36,509 journals. However, after applying the inclusion and exclusion criteria outlined in Table 1, the number of publications was narrowed down to 1,905 for the final search. This reduction was due to the exclusion of 34,604 documents.

Inclusion and Reporting

The findings of this bibliometric analysis are reported based on the PRISMA framework (see Figure 1). (Moher et al., 2010). Thus, the following section will start addressing the research question.

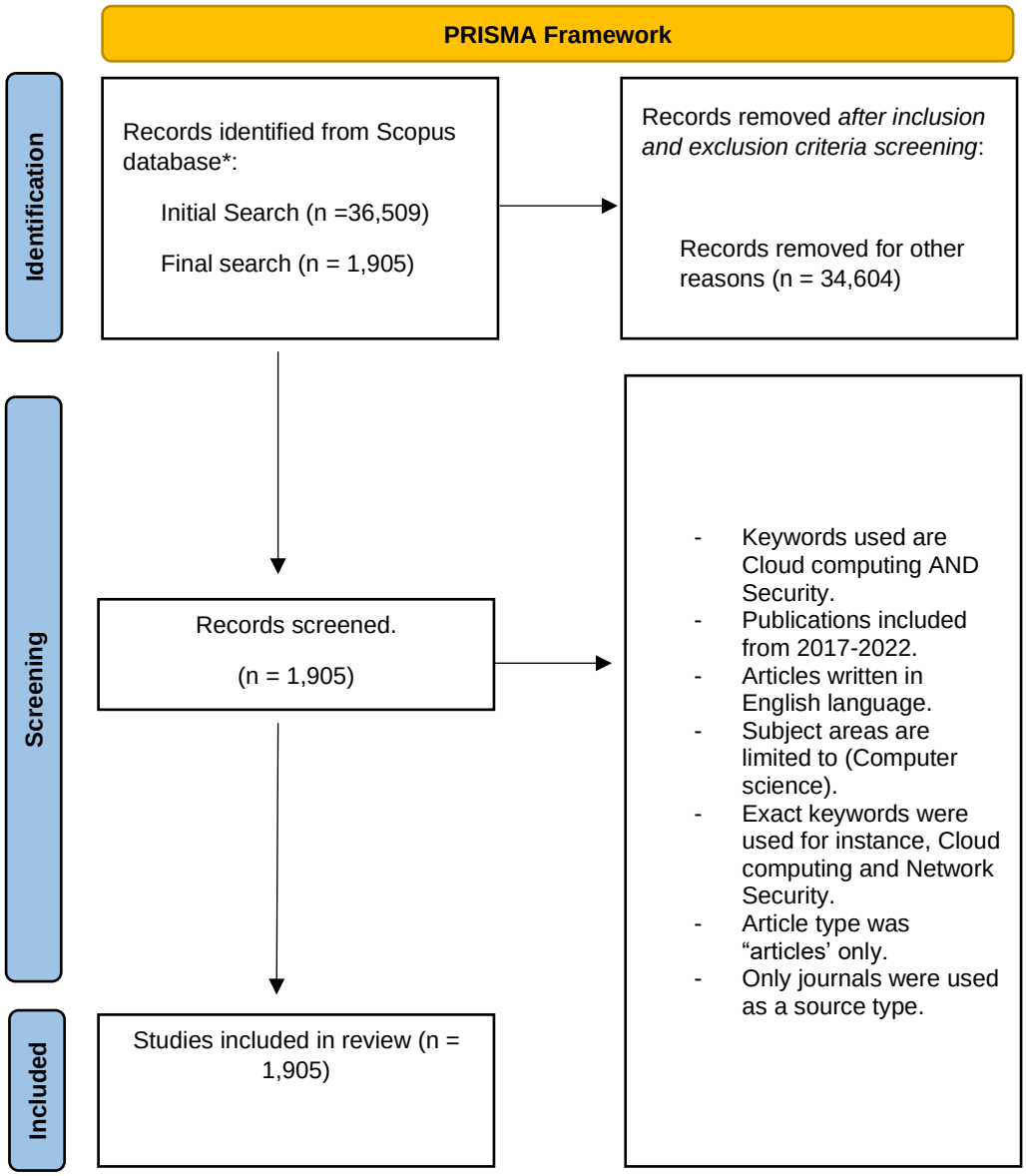

Figure 1: Prisma framework for this review

Results

This section illustrates the comprehensive findings of a bibliometric search on the analysis of cybersecurity trends in cloud computing. The investigation extends to a six-year research period and recommends significant insights into this quickly developing field. It goes through a wide range of factors, including notable subjects, publication trends, influential journals, and countries, leading academic institutions, productive authors, and primary research keywords. The purpose of this compilation is to follow the evolution of research in cloud computing, identify the core elements driving academic exploration, and offer a holistic view of global efforts to understand the impact of cybersecurity vulnerabilities on cloud computing.

The distribution by Years

This section's aim is to answer the research question: "What is the growth distribution of cybersecurity in the cloud computing literature during the years 2017–2022?" By conducting a full analysis of provided data, we can examine the first research on cybersecurity trends in the literature on cloud computing from 2017 to 2022. The data reveals a noticeable growth in the volume of publications which has recently shown cybersecurity trends related to cloud computing. Statistical evidence supports this trend. There has been a steady annual increase in the number of publications since 2017, from 157. Notably, this increase will be significant after 2019, and culminated in a record number of publications in 2022. Recently all these years have shown a significant increase and interest in the focus and research in this area.

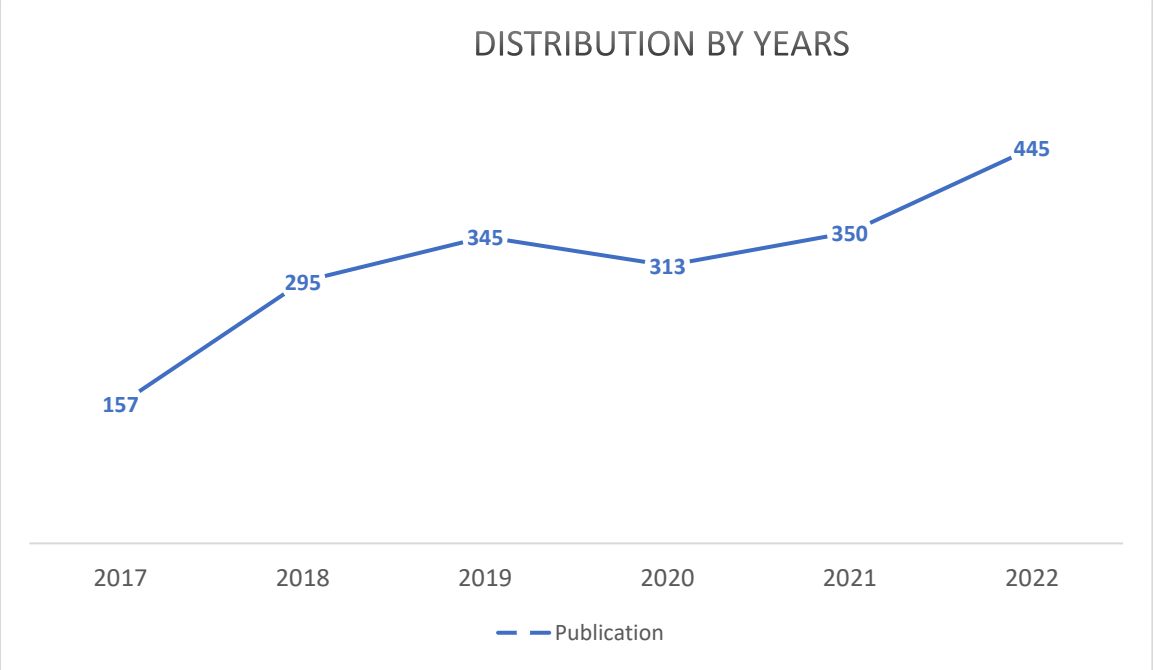

Figure 2: distribution by years.

Figure 2 illustrates the data from 2017 to 2022 on the distribution of publications related to cybersecurity trends in cloud computing. The data shows a significant upward trajectory, indicating an increasing academic interest in this area. In 2017, there were 157 publications, and this number has consistently increased annually. By 2020, the publications figure had risen to 313. A significant increase in the number of publications was clearly observed starting in 2019, with 345 works published. This increase continued, with 313 publications in 2020, 350 in 2021, and hit the peak at 445 in 2022. The consistent raise trend, particularly the substantial increase over the past three years, suggests a heightened focus on cybersecurity trends in cloud computing. This trend could be because of the global shift towards cloud applications, a change necessitated by the COVID-19 pandemic. The data reflects a growing academic and practical interest in the impact of cybersecurity on cloud computing, indicating the emergence of a rapidly evolving research field characterized by innovative methodologies and an expanding body of knowledge.

The Most Relevant Journals

In relation to the second research question, which scholarly publications are most relevant to the exploration of cybersecurity trends in cloud computing? Table 2 showcases a diverse range of publications that have made significant contributions to this subject, based on the data provided for the period from 2019 to 2022.

Table 2
Top 10 journals in Cloud Computing and Cybersecurity Trends research

Journal	TP (2019-2022)	TC (2019-2022)	cite score (2022)	Most cited article	Times cited	Publisher
IEEE Access	54,351	490,387	9.0	A Metaverse: Taxonomy, Components, Applications, and Open Challenges	497	IEEE
International Journal of Advanced Computer Science and Applications	4,553	9,537	2.1	Breast Cancer Detection and Classification using Deep Learning Xception Algorithm	33	Science and Information Organization
Security and Communication Networks	2,492	6,458	2.6	Computational Technique Based on Machine Learning and Image Processing for Medical Image Analysis of Breast Cancer Diagnosis	60	Hindawi
Sensors	30,875	210,254	6.8	Comparing YOLOv3, YOLOv4 and YOLOv5 for Autonomous Landing Spot Detection in Faulty UAVs	214	Multidisciplinary Digital Publishing Institute (MDPI)
Computers, Materials and Continua	3,136	15,573	5.0	Robust reversible audiowatermarking scheme for telemedicine and privacy protection	148	Tech Science Press
Wireless Communicatio	4,310	9,730	2.3	Deep Reinforcement Learning-Based	61	Hindawi

ns and Mobile Computing				Path Control and Optimization for Unmanned Ships		
Journal of Cloud Computing	244	1,572	6.4	Future of industry 5.0 in society: human-centric solutions, challenges, and prospective research areas	86	Springer Nature
IEEE Transactions on Cloud Computing	524	5,223	10.0	Efficient Identity-Based Provable Multi-Copy Data Possession in Multi-Cloud Storage	96	IEEE
Computational Intelligence and Neuroscience	1,113	4,319	3.9	Real-Time Twitter Spam Detection and Sentiment Analysis using Machine Learning and Deep Learning Techniques	62	Hindawi
Future Generation Computer Systems	2,340	49,258	21.1	Recent advancements and challenges of Internet of Things in smart agriculture: A survey	199	Elsevier

TP= Total publications, TC= Total citations

The journals that are most pertinent to the subject of cybersecurity trends on cloud computing are shown in Table 2. The data spanning from 2019 to 2022 underscores several significant articles. " IEEE Access," a scholarly journal distributed by IEEE, distinguishes itself via its remarkable total of 54,351 articles and 490,387 citations. The article that receives the most citations, 497, pertains to Taxonomy, Components, Applications, and Open Challenges and has a citation count of 9. In the meantime, the " International Journal of Advanced Computer Science and Applications," published by the Science and Information Organization, demonstrates a significant impact with a total of 4,553 articles, 9,537 citations, and a cite score of 2.1. With 33 citations, its Breast Cancer Detection and Classification using Deep Learning Xception Algorithm has attracted attention. The journal " Security and Communication Networks," which is published by Hindawi, is distinguished by its 2,492 articles, 6,458 citations, and 2.6 cite score. With 60 citations, its most-cited piece Computational Technique Based on Machine Learning and Image Processing for Medical Image Analysis of Breast Cancer Diagnosis. Likewise, " Sensors," an official magazine of

Multidisciplinary Digital Publishing Institute (MDPI), has an exciting compilation of 30,875 publications and a remarkable 210,254 total citations, accompanied with a cite score of 6.8. Cited 214 times, the journal's main article Comparing YOLOv3, YOLOv4 and YOLOv5 for Autonomous Landing Spot Detection in Faulty UAVs. " Computers, Materials and Continua" by Tech Science Press makes a scholarly contribution of 3,136 articles, 15,573 citations, and a cite score of 5.0. Cited 148 times, its linchpin piece Robust reversible audio watermarking scheme for telemedicine and privacy protection. With a cite score of 2.3, the " Wireless Communications and Mobile Computing," another publication by Hindawi, catalogues 4,310 articles and 9,730 citations. Among these, Deep Reinforcement Learning-Based Path Control and Optimization for Unmanned Ships, having been cited 61 times.

Springer Nature 's " Journal of Cloud Computing" has a cite score of 6.4 with a substantial publishing count of 244 articles and 1,572 citations. With 86 citations, its most-cited paper focuses on Future of industry 5.0 in society: human-centric solutions, challenges, and prospective research areas. " IEEE Transactions on Cloud Computing," an IEEE publication, with a cite score of 10.0 and 524 articles and 5,223 citations. Cited 96 times, a prominent paper from this magazine presents Efficient Identity-Based Provable Multi-Copy Data Possession in Multi-Cloud Storage. Furthermore, Hindawi Articles' " Computational Intelligence and Neuroscience" has a cite score of 3.9 and is comprised of 1,113 publications and 4,319 citations. Its most-cited paper, which is sixty-two times, Real-Time Twitter Spam Detection and Sentiment Analysis using Machine Learning and Deep Learning Techniques. Finally, " Future Generation Computer Systems " by Elsevier, which has been referenced 49,258 times and has 2,340 publications and a cite score of 21.1, has a 199-times-cited important paper on Recent advancements and challenges of Internet of Things in smart agriculture: A survey. Journals with high citation counts, prolific publication counts, and important publications have significantly influenced the development of research pertaining to cybersecurity trends in cloud computing.

The most significant countries

In response to the third research question, which countries have the most influence on cybersecurity trends in cloud computing research? The data analysis indicates a diverse global impact, as depicted in Figure 3, which shows the distribution of publications by country.

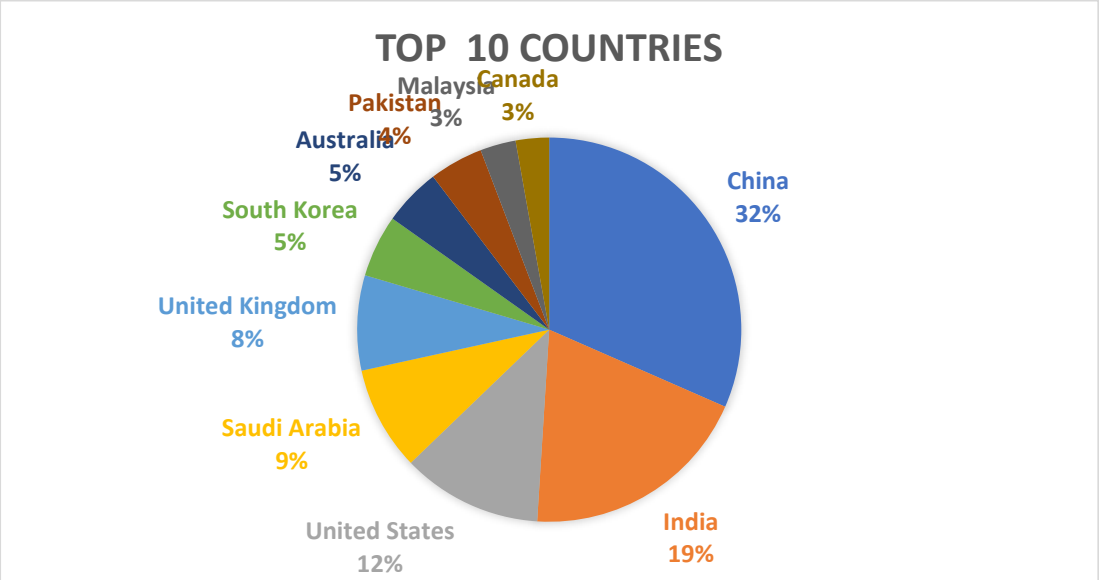

Figure 3. Publications distributions by countries

With a cumulative count of 663 articles, China emerges as the frontrunner in this field of study (figure 3), signifying a considerable commitment and financial investment in comprehending the intricacies of analyzing cybersecurity trends and its impact on cloud computing. The India ranks behind with 408 articles, which demonstrates its substantial contribution to the advancement and investigation of innovative approaches to mitigate Cloud computing vulnerabilities. United State, with 327 articles, appears as a significant contributor, demonstrating its expanding emphasis on Cloud technology. A substantial Meddle East interest in the area is shown in Saudi Arabia's 184 articles, which mostly concern the investigation of the ways in which eliminate the Cloud computing threats. The rising importance that United Kingdom places on Cloud risks is shown by its 168 publications, which is particularly pertinent in a nation with such a large application in variety life aspects. South Korea substantial body of work in this field, consisting of 110 publications, underscores the nation's dedication to study the cybersecurity in the Cloud. In 102 publications, the Australia demonstrates its enduring fascination with Clouding technology and its practical implementations. Pakistan demonstrates its research prowess in technical innovation within the field of cybersecurity via its 95 publications. The 63 papers contributed by Malaysia demonstrate an increasing regional interest in the analysis of cybersecurity trends improve Cloud Computing. Canada's involvement in the creation and investigation of intimidation of cybersecurity and their effects on Cloud is shown by its fifty-nine publications.

Collectively, these nations constitute a substantial proportion of the worldwide scholarly investigation concerning analyzing cloud computing and cyber security trends. This underscores the extensive and multifaceted nature of the interest that transcends continents. The wide-ranging contributions highlight the worldwide significance of cloud computing in contemporary usages and the international pursuit to eliminate its cybersecurity threats influence.

The most significant educational institutions

The data provided in response to the fourth research question - “Which academic institutions have made significant contributions to the study of cybersecurity trends in cloud computing?” - highlights several such institutions. This can be observed in Figure 5, Table 3, and Figure 4.

Table 3
Top 10 Educational institution in Cloud Computing and Cybersecurity Trends research

Educational institution	**TP**	**Country**
Xidian University	48	China
King Saud University	37	Saudi Arabia
Beijing University of Posts and Telecommunications	34	China
Chinese Academy of Sciences	34	China
Singapore Management University	31	Singapore
University of Electronic Science and Technology of China	30	China
Ministry of Education of the People's Republic of China	23	China
Institute of Information Engineering	22	China
King Abdulaziz University	21	Saudi Arabia
Shandong University of Science and Technology	20	China

TP= Total publication

As shown in Table 3, most prolific education institutions in the Cloud Computing and Cybersecurity Trends. China has the leading country in this area of research, due to the fact that 7 educational institutions based on it, for instance, Xidian University, Beijing University of Posts and Telecommunications, Chinese Academy of Sciences, University of Electronic Science and Technology of China , Ministry of Education of the People's Republic of China, Institute of Information Engineering and Shandong University of Science and Technology, these institutions Total publications (TP) were as follow, 48, 34,34,30,23,22, 20.

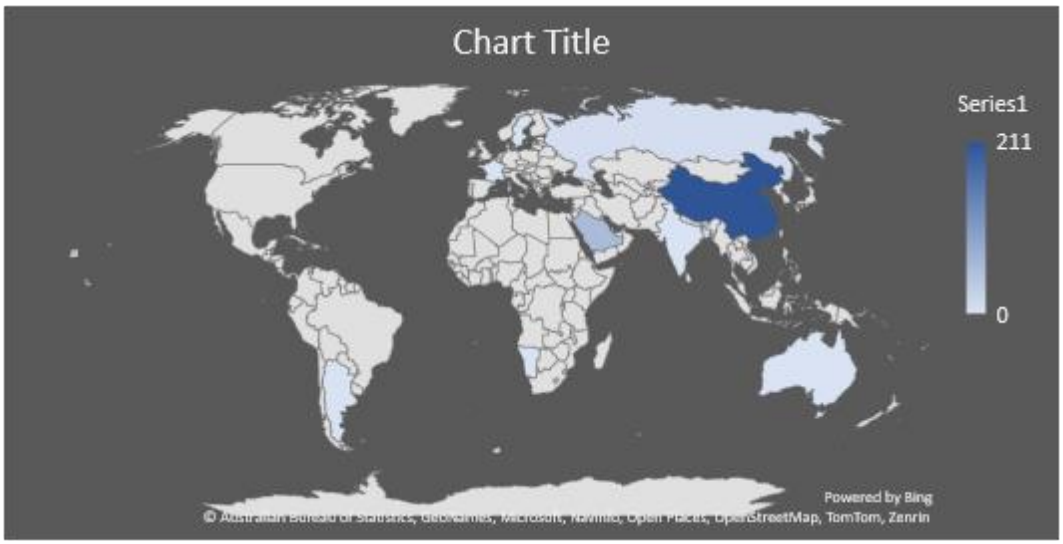

Figure 4: the geographical distributions of publications

From Middle East, Saudi Arabia followed with two leading institutions Universities King Saud University, and King Abdulaziz University, with 37, and 21 total publications, this illustrates the institutions dedication to the impact of cloud computing area in the Information technology field. With a notable thirty-one publications, Singapore Management University distinguishes itself across Southeast Asia, displaying Singapore's dedication to the progression of cybersecurity technology. The Vos Viewer software-based examination of the geographical distribution is shown in Figure 5.

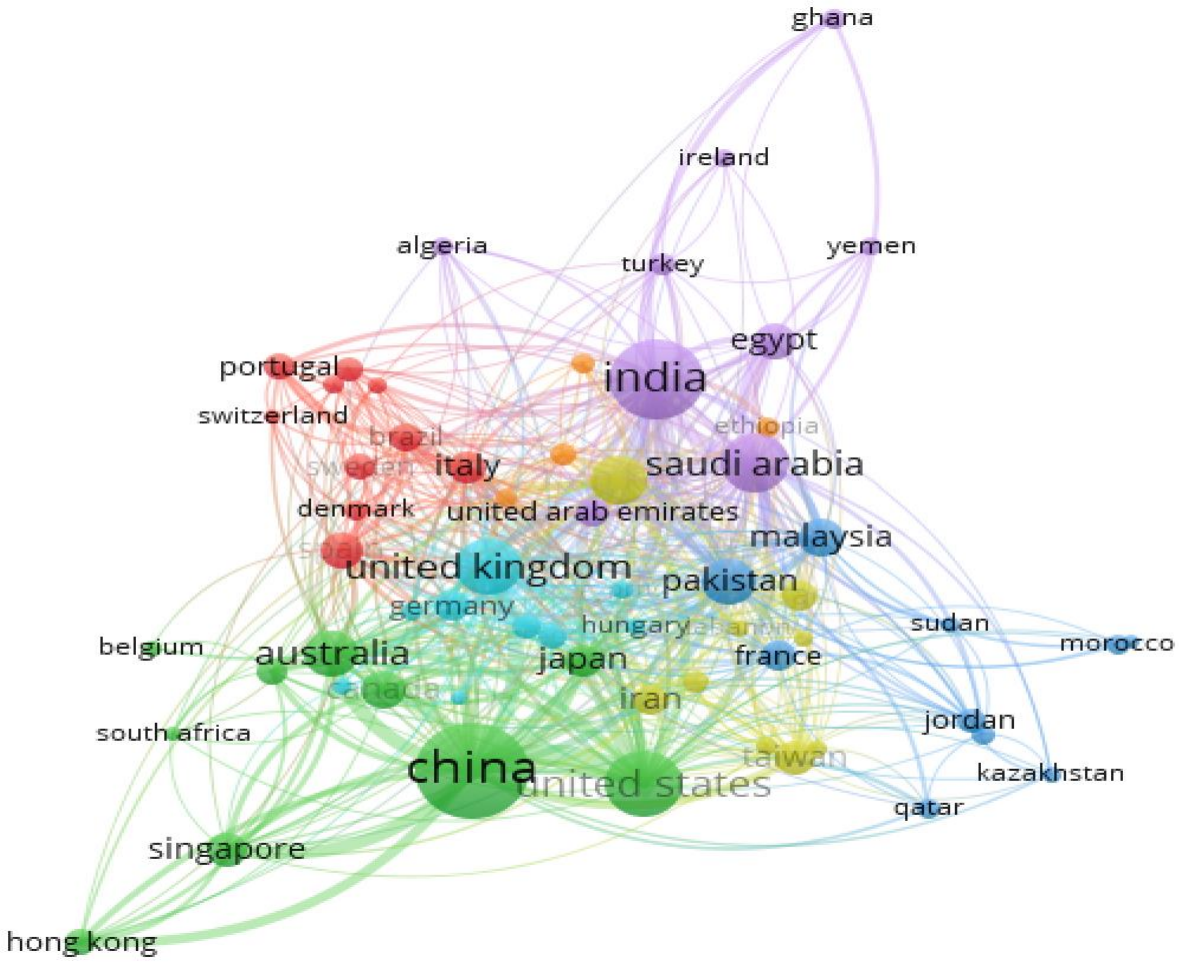

Figure 5: the geographical distribution based on Vos Viewer software.

The global presence of these institutions in various countries underscores the international reach of cloud computing research. Their significant contributions represent the diverse methodologies and perspectives involved in analyzing cybersecurity and its impact on the Cloud. This diversity not only enriches the field but also contributes to a comprehensive understanding of how cybersecurity issues are influencing the widespread use of cloud computing in various aspects of our lives.

The most prolific authors

In response to the fifth research question - "Which authors have made significant contributions to the field of cybersecurity trends in cloud computing?" - the data presented in Table 4 highlights several authors who have made remarkable contributions in this area.

Table 4
Top 10 authors in Cloud Computing and Cybersecurity Trends research area.

Author	Year of first publication	TP	h-index	TC	Current affiliation	Country
Buyya, Rajkumar	1999	960	118	74,857	University of Melbourne	Australia
Deng, Robert H.	1995	606	61	14,467	Singapore Management University	Singapore
Liu, Ximeng	2013	269	35	4,197	City University of Macau	Macao
Yan, Zheng	2003	341	44	7,765	Xidian University	China
Susilo, Willy	1999	796	68	17,903	University of Wollongong	Australia
Chang, Victor I.	2004	451	59	13,252	Aston University	United Kingdom
Choo, Kim Kwang Raymond	2004	1,115	96	36,283	The University of Texas at San Antonio	United States
Park, Young Ho	2005	142	35	3,317	Kyungpook National University	South Korea
Wu, TsuYang	1973	172	32	3,139	Nanjing University of Information Science & Technology	China
Du, Xiaojiang	2002	639	65	18,007	Stevens Institute of Technology	United States

TP: Total Publications. TC: total Citations.

The most prolific authors are shown in Table 4. For example, Choo, Kim Kwang Raymond, who published his first work in 2004, has accumulated a remarkable 1,115 publications and an h-index of ninety-six, which translates to 36,283 citations. Choo, who is now associated with the University of Texas at San Antonio in United States, has established himself as a preeminent authority in the subject via his substantial body of research. Since Buyya, Rajkumar started his academic career in 1999, he has amassed 960 articles to date, garnering 74,857 citations and an h-index of 118. His affiliation with University of Melbourne in Australia signifies his increasing prominence in the field of study in question. Since his first publication in 1999, Susilo Willy has accumulated a total of 796 articles and now has an h-index of sixty-eight. The 17,903 citations she has accumulated and his association with University of Wollongong in Australia testifies to her lasting and influential reputation in the area. Du, Xiaojiang has accumulated a significant h-index of 65, 639 articles, and 18,007 citations since his inception in 2002. His affiliation with Stevens Institute of Technology in United States underscores the considerable advancements that the country has achieved in

the domain of cloud computing research. 606 of Deng, Robert H.'s papers have been cited 14,467 times and have earned him an h-index of 61. The individual's association with Singapore Management University in Singapore highlights the growing academic focus on cloud computing within the field. Since his first publication in 2004, Chang, Victor I. has accumulated an h-index of 59, 451 articles, and 13,252 citations. This academic discipline is examined from a European standpoint via his affiliation with Aston University in United Kingdom. Yan, Zheng, who started his scholarly pursuits in 2003, has produced a total of 341 publications. These works have received 7,765 citations and have an h-index of 44. His association with the Xidian University in China indicates that he has made a substantial contribution to the area. Since 2013, Liu, Ximeng, who has amassed 4,197 citations and an h-index of 35, has published 296 papers. His affiliation with City University of Macau contributes to the elevation of the country's standing in the field of cloud computing research. Hundred seventy-two publications authored by Wu, TsuYang have received 3,139 citations and an h-index of thirty-two since 1973. This demonstrates China's dedication to the field of cloud computing research via his association with Nanjing University of Information Science & Technology. Since his first publication in 2005, Park, Young Ho has accumulated 3,317 citations and hundred forty-two articles, which is reflected in his h-index of thirty-five. Kyungpook National University in South Korea is with which he is intellectually affiliated.

The authors' extensive research and publications have significantly influenced the understanding and progression of cybersecurity trends and their impact on cloud computing. Their diverse international affiliations further underscore the global reach of this field of study.

The primary research keywords and trends

Addressing the sixth question, "What have been the key research terminologies related to cybersecurity trends in cloud computing over the past six years?" The diagram depicts the main research terminologies along with their frequency, as demonstrated by the data in the image.

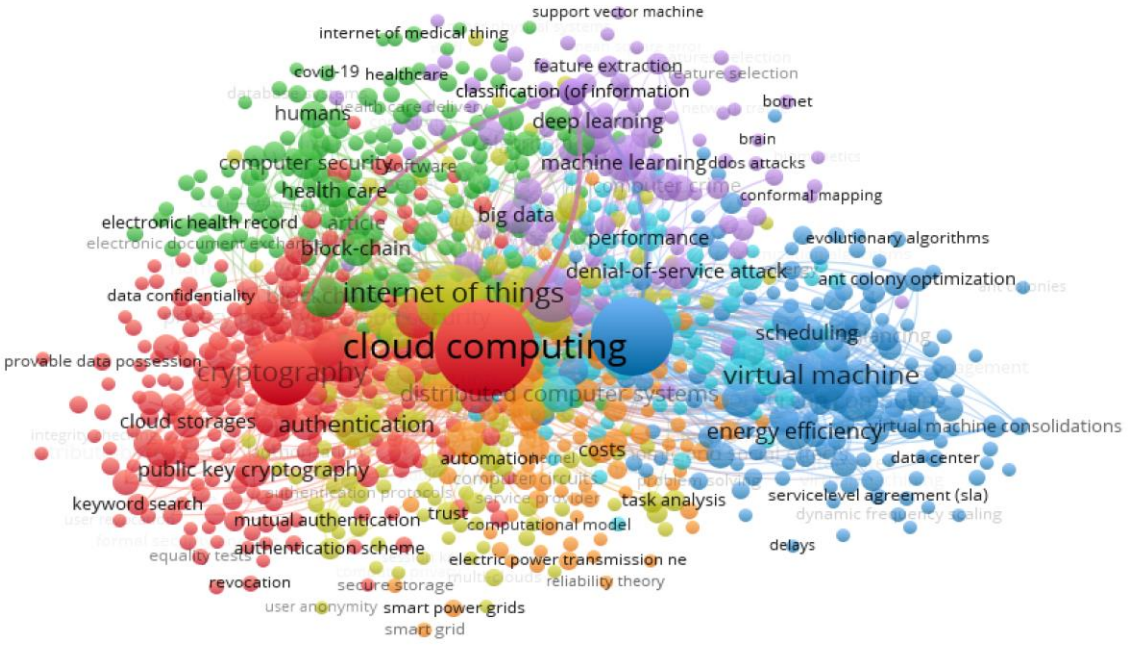

Figure 6: The primary research keywords and their occurrences

Figure 6 presents the frequency of key research terms over the past six years, revealing a wide range of primary research keywords related to cybersecurity trends in cloud computing. This diversity reflects the extensive range of interests within this field. The term "cloud computing" emerged as the most common keyword, appearing 1,5693 times, highlighting its pivotal role in information technology research. The term "network security" also appeared frequently, used 844 times, emphasizing the primary focus of the research. The terms "cryptography" and "internet of things," appearing 446 and 374 times respectively, highlight the significant focus on the methods and technologies employed in cloud computing. The frequent usage of the terms "digital storage" and "Virtual machine" underscores other facets of cloud computing applications. The broad approach is evidenced by the presence of "data privacy," "authentication," "fog computing," and "edge computing" in the list (146–243), suggesting that it encompasses not only core technologies like the cloud but also future technologies succeeding cloud computing. A concentrated exploration of areas such as "green computing" and "energy utilization" indicates a focus on performance metrics and sustainability factors. The frequent appearance of the terms "block-chain" and "trusted computing" signifies a substantial interest in state-of-the-art technology and analytical methods. Lastly, the study places considerable emphasis on the impact of "cybersecurity trends," underlining the overarching goal of enhancing cloud computing services.

The most important subject area

In response to the seventh research question, "Which subject area is most crucial concerning cybersecurity trends in cloud computing?" According to the data provided, Computer Science stands out as the most significant area of study, boasting an impressive total of 1907 articles, as depicted in Figure 7.

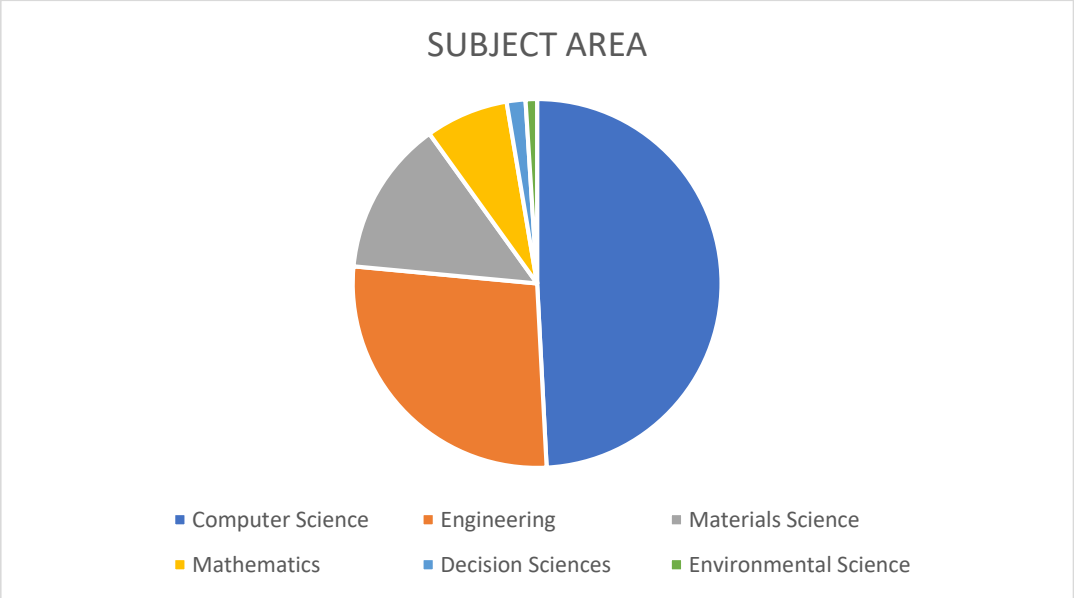

Figure 7: The most important subject area

As depicted in Figure 7, Engineering is the second most significant field, with a considerable interest in the technological advancement of various methods, as evidenced by its 1059 articles. This includes the application of engineering principles in the enhancement and development of technology. Material Science, with 527 articles, is another major area of

interest, aimed at improving various aspects of cloud computing, such as sustainability. While the presence of certain subject areas may be limited, they still make substantial contributions to the field. With a combined total of 527 to 39 papers, Material Science, Mathematics, Decision Science, and Environmental Science respectively make significant contributions to the knowledge base regarding the use of the cloud.

To sum up, although a significant amount of research has been carried out in the field of Computer Science regarding cybersecurity trends in cloud computing, numerous other academic disciplines also contribute to a holistic understanding of this complex subject. This bibliometric analysis reveals a broad spectrum of academic papers that deepens our comprehension of the relationship between cybersecurity and cloud computing. The growing volume of articles, the variety of contributing nations and institutions, and the prominence of certain subject areas and keywords all indicate that cloud computing is becoming increasingly significant in the field of information technology. The results underscore the interdisciplinary nature of cloud computing research, showcasing the joint efforts of scholars, technologists, and professionals from numerous countries. This research not only provides valuable insights into the existing body of knowledge but also paves the way for future investigations that will continually influence various aspects of cloud computing applications in our lives.

Discussion

Related to the developing field of cloud computing and the effect of cybersecurity on it, the bibliometric analysis in this article offers a complete perspective. The findings show the advancement and expansion of an academic field characterized by diverse contributions from various institutions and nations, besides an increasing scholarly interest.

Trends in Publication and Geographic Distribution

An impressive number of academic articles examining the relationship between cloud computing and cybersecurity trends, especially after 2019, show increasing academic interest in this particular area: China, India, USA, Saudi Arabia, United Kingdom, South Korea, Australia, Pakistan, Malaysia, . How are significant contributions from countries such as Canada, whose participation in these publications extends around the world, highlighted in a way that shows its global reach? Research The impact of cultural diversity and performance on the adoption of cloud computing strategies is an interesting area that offers a wealth of perspective and insight.

Influential Journals and Educational Institutions

The review points out leading academic publications and institutions conducting advanced research in the cloud computing field. This information is essential for scholars who wish to participate in state-of-the-art research in the same area. Furthermore, the prominence of these academic institutions and publications not only indicates their academic influence but also their potential to impact future policies in cloud computing.

Prolific Authors and Research Keywords

Continued engagement and accomplishments of distinguished scholars are recognized through recognition of authors who excel in this field. Their research forms an important foundation for our current understanding and future development of cloud computing. Additionally, keywords pulled from key search areas provide valuable insights into the

breadth and complexity of the field, including topics such as cloud-based, productivity and security compared to terms such as “cloud computing” and “performance”, focusing on low latency and new dimensions of cloud computing, then popular terms like “fog computing” and “edge computing” suggest that there is great potential in this technology>

Subject Areas and Their Implications

The research spans multiple disciplines, emphasizing the interdisciplinary nature of outsourcing. The popularity of computer science and physics means that technological progress has coincided with environmental science. Using an interdisciplinary approach is critical to creating attractive and efficient cloud computing environments to address the wide range of use cases for this technology.

In conclusion, this bibliometric analysis provides a holistic view of the present and future direction of scholarly work concerning trends in cybersecurity and cloud computing. This expanding knowledge base holds value not only in academia but also offers practical insights for professionals, policymakers, and businesspeople. Keeping up to date with the latest advancements in cloud computing is crucial to ensure the cloud technology landscape remains effective, economical, secure, and accessible, given that cybersecurity is properly managed.

Summary of the results of this review

The mentioned table provides a comprehensive summary of the data derived from this research article, which critically examines the developments, implications, and possible future directions of cloud computing. Particularly, focusing on the impact of cybersecurity trends on it. These categories provide an understanding of academic perspectives, geographical distributions, leading authors, and specific topic focuses of the review of cloud computing aims to identify the current state of affairs and predict future directions in that in this rapidly growing field, as shown in Table 5

Table 5
A Thorough Examination of Cloud Computing and the influence of cybersecurity on it: Principal Discoveries and Prospects for the Future

Aspect	Findings	Implications	Trends	Future Agenda
Publications	An enormous surge of publications after 2019. In 2022, the greatest number of publications (445) was produced.	An increased scholarly focus on cloud computing is evident, particularly in light of the COVID-19 epidemic.	Consistent yearly expansion of publications, marked by a significant upsurge starting in 2019.	Ongoing investigation to comprehend and improve the effect of cybersecurity trends on cloud computing.
Journals	" IEEE Access," " International Journal of Advanced Computer Science and Applications,"	Academics in pursuit of the most recent developments in cloud computing	Extensive contributions from a variety of periodicals, with an	Additional investigation into mitigating approaches in

	and " Security and Communication Networks" are all significant periodicals.	must consult these periodicals.	emphasis on enhancing the cloud computing security.	the field of cloud computing.
Countries	Most significantly contributing nations are China, India the United States, and Saudi Arabia.	Indicative of many universities and companies and the worldwide aspect of cloud computing research.	Increasing contributions from couple nations on a worldwide scale.	International research that is more collaborative in order to improve global cloud computing environment.
Educational Institutions	Xidian University, King Saud University and Beijing University of Posts and Telecommunications are notable donors to this cause.	The significance of educational institutions in the progression of cloud computing research is emphasised.	Cloud computing research is produced in significant quantities by couple of countries, including China and Saudia Arabia, amongst others.	It is important to encourage additional educational institutions all around the globe to participate in research on Cloud Computing.
Authors	There is a mixture of recognised and new scholars in the subject, as shown by the fact that notable writers such as Buyya, Rajkumar and Choo, Kim Kwang Raymond contributed to the writing.	In the field of ecloud computing, this article highlights the devotion and accomplishments made by individual researchers.	There is a combination of seasoned researchers and newcomers who are contributing to the area.	It is important to provide researchers with support and recognition to encourage additional advancements in cloud computing.
Keywords	The following are some of the most important keywords: "cloud," "computing," **"**cybersecurity," "cloud vulnerability," "cloud mitigation,"	reflects the emphasis placed on cloud service security issues, new aspect of threads, and technology in the context of cloud computing.	This reflects the emphasis that cloud computing places on things like technology, business, and wide-spread	In the realm of cloud computing, further investigation into cutting-edge enhancement services and

	and "network security."		this technology in other dimensions.	raising the security level.
Subject Areas	In terms of importance, the most significant subject fields are computer science and engineering, followed by engineering, material science and mathematics.	The interdisciplinary character of cloud computing is shown by the fact that it combines the development of technology in efficiency way.	Research that draws from a variety of disciplines and places a significant emphasis on making cloud services secure for utilize for in multi-aspects	Putting an emphasis on multidisciplinary methods in order to develop efficient online cloud service environments that can accommodate a wide range of security requirements

Table 5 below illustrates an analysis of evolving cybers security trends in cloud computing, which clearly shows that the field is a dynamic area constantly in an expansion process. Firstly, the number of academic articles and international participation has surged since the year 2019; therefore, it suggests that cloud-computing has become a very important and vibrant area, as a result of covid-19 pandemic. Secondly, the active involvement from a large number of countries, academic institutions and researchers clearly shows the multi and inter-disciplinary environment of cloud computing. Cloud computing is widely regarded as a crucial field of study and application, because it is involved in mitigating most of the business, educational and other civilian needs. Looking forward, we can anticipate a much greater emphasis on leveraging emerging technologies, creating global collaborations, and advancing interdisciplinary research in order to improve the efficiency and narrow down the threat areas of the cloud computing environment. There is a positive sign for cloud security research and development in the future.

Conclusion

Lastly, the bibliometric literature review made of this research suggests cybersecurity's increased impact on cloud computing, contributing to the emergence of a set of relevant research trends. It is also observed that academic research on cloud computing increased considerably over 6 years; moreover, the global and interdisciplinary nature of cloud computing research is shown through keywords, and the number of contributing countries and institutions. The international cooperation of countries, corporations, technolo-gists, and researchers have also not only contributed to the research state of the art, but also provide a new starting point for future research. Cloud technology needs to be shaped through continuous research because outsourcing is probably going to grow every day. This is why service experience of cloud technology should be our future target.

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