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CONVERGENCE BETWEEN ARTIFICIAL INTELLIGENCE AND AUDIOVISUAL PRODUCTION:
A Bibliometric Analysis of its Evolution, Trends and Contributions (2000-2024)

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KEYWORDS

Artificial intelligence
Machine learning
Deep learning
Audiovisual production
Audiovisual
Generative AI

ABSTRACT

Over the past 25 years, the convergence between artificial intelligence (AI) and audiovisual production has grown exponentially, driving advancements with significant interdisciplinary implications. This study conducts a comprehensive bibliometric analysis to understand the evolution of research in this field. Using the Bibliometrix tool in R Studio, it examines publication patterns, scientific collaboration networks, and geographic influence, identifying key authors and institutions. The analysis also reveals emerging areas with high development potential, serving as a guide for future research and strategic decision-making in science and technology. Interdisciplinary cooperation is highlighted as a key driver for new lines of study. Overall, the study offers a valuable roadmap for consolidating an academic and professional ecosystem where AI and audiovisual production are innovatively integrated, transforming creative processes in the digital age.

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1. Introduction

Artificial Intelligence (AI) has experienced exponential growth in developments oriented towards the creation of audiovisual content. The integration of AI into various stages of audiovisual production has optimized workflows, streamlining processes, reducing production costs, and expanding creative possibilities.

The theoretical foundations underpinning this study focus on the intersection between AI and audiovisual production. (Hinojosa Becerra et al., 2024) state that AI is not only revolutionizing content production but also poses ethical and creative challenges that require critical analysis. A similar perspective is offered by Faranguillo (2023), who suggests that Generative AI is transforming content creation with tools that optimize production processes. However, challenges persist regarding the perception of quality and authenticity in AI-generated products, such as disinformation and privacy violations. Faranguillo also advocates establishing appropriate regulatory and ethical frameworks to mitigate these risks and emphasizes the importance of preparing future professionals through education adapted to new technologies. Furthermore, the bibliometric analysis is grounded in the need to understand how disruptive technologies, such as AI, are being integrated into contemporary audiovisual productions, as evidenced by recent studies highlighting the significance of these technologies in professional training and practice.

Franco Lazarte (2025) asserts that AI is changing the way audiovisual content is produced and consumed, enabling greater production efficiency and facilitating new forms of narrative expression. Additionally, the author notes that AI directly influences various stages of production, from idea generation and scriptwriting to the creation of visual effects, expanding creative and technical possibilities that transform storytelling. The author points out that, while AI has the potential to drastically alter audiovisual production, its incorporation into the creative process must be strategic to maintain originality and authenticity.

Encinas (2024) also analyses ethical aspects and the implications of using AI for generating creative writing in audiovisual productions. In this regard, the author states that tools like ChatGPT can serve as significant support in drafting and structuring scripts but argues that they present limitations in terms of creativity and innovation.

On the other hand, (Caballero et al., 2024) analyse dominant trends and tools such as Runway, Midjourney, Stable Diffusion, and ChatGPT, as well as emerging workflows in AI-driven film production. They observe a growing adoption of AI in audiovisual production, with a focus on experimental narratives. Among the main findings, the authors indicate that Generative Artificial Intelligence (GAI) facilitates experimentation with non-linear narratives, historical reconstruction, character generation, and the creation of fantastical settings.

In the auditory domain, Dale (2022) states that advances in deep learning have expanded creative and functional possibilities, enabling the creation of synthesized voices that realistically simulate human characteristics such as tone, speed, pronunciation, and inflection. This progress has driven the development of commercial applications in areas such as automated reading, narration, and dubbing of audiovisual content.

Similarly, Lozano and Mejías-Climent (2023) analyse the impact of automated translation (AT), particularly neural machine translation (NMT), in the context of audiovisual translation (AVT). The authors note that the incorporation of AI into AVT has optimized translation and dubbing processes but has also raised concerns about quality, creativity, and ethics in the profession. Additionally, they suggest that AI will not entirely replace human work but will modify its functions. At the same time, they indicate that, while productivity has increased, issues of synchronization, interpretation, and cultural adaptation still require human intervention.

Furthermore, Botha and Pieterse (2020) argue that the inexorable advance of AI aligns with computer-generated imagery (CGI) techniques. Thus, Deepfake technology (false content generated using deep learning techniques) is radically transforming the recreation of digital characters in the audiovisual industry. This technology employs Generative AI to create highly realistic images, making it difficult to discern whether an image is real or fake. A notable example is its application in the film The Irishman (2019), directed by Martin Scorsese. For the production of the film, techniques were used to rejuvenate the fictional characters played by Robert De Niro and Joe Pesci, allowing them to portray their characters across different eras.

On the other hand, (Vizoso et al., 2021) highlight the negative impact of deepfakes on the credibility of information. Additionally, technological democratization has enabled average users, through the use of AI, to modify original audiovisual content, increasing the difficulty of verifying such content. The authors further note that the rapid evolution of AI in the context of audiovisual production will bring new ethical and verification challenges, emphasizing the need to develop more effective protocols and tools.

Nevertheless, despite these significant advances, it is crucial to understand how academic research on AI and its convergence with audiovisual production has evolved and what the current and future research trends are. (Donthu et al., 2021) suggest that a bibliometric analysis offers a quantitative methodology to evaluate scientific output, identifying patterns, trends, and emerging areas of interest. This approach is essential for mapping the research landscape surrounding this highly topical subject.

The objective of this article is to conduct a comprehensive bibliometric analysis of academic research on artificial intelligence in the context of audiovisual production from 2000 to 2024. This objective seeks to understand how research in this area has evolved, identify influential authors and institutions, and explore key and emerging thematic areas, as well as the collaboration networks that have developed. By addressing these issues, we aim to provide a comprehensive overview of the current state and trends of research at the intersection of AI and audiovisual production, contributing to the understanding of this technology's impact on the audiovisual industry. The findings will be valuable for both academics and industry professionals, providing a solid foundation for future research and collaborations.

2. Methodology

To analyse the evolution of academic research surrounding AI in audiovisual production between the years 2000 and 2024, a quantitative and systematic methodology was applied based on the bibliometric analysis of bibliographic data. This approach enabled the identification of patterns in scientific production, emerging thematic trends, and collaboration networks among different authors within the field of study.

For this analysis, only the Scopus database was selected as the main source of information due to its extensive coverage, international recognition, and rigour in this type of systematic study. The Scopus database offers the optimal and necessary tools for the quantitative analysis of bibliographic data, which allowed for a thorough and meticulous analysis to be conducted.

The search for publications was carried out through the combination of specific keywords and the use of Boolean operators. The terms employed were the following: ("artificial" AND "intelligence" OR "ai") AND ("audiovisual" OR "audiovisual AND productions" OR "audiovisual AND aid" OR "narrative" OR "cinema" OR "movies" OR "television" OR "television AND broadcasting" OR "animation" OR "computer AND graphics" OR "three-dimensional AND animation" OR "3d AND animation" OR "social AND media" OR "advertisement" OR "ads" OR "tv AND commercial" OR "publicity AND campaigns").

These terms allowed for a broad spectrum of scientific production related to AI and its relationship with audiovisual production in any of its stages—pre-production, production, or post-production—to be covered. The initial search in Scopus with these terms yielded a total of 380 documents. To refine the selection and ensure the relevance and quality of the publications, a series of filters and inclusion and exclusion criteria were applied. Publications from the year 2000 to the year 2024 were included, taking into account all documents indexed in the Scopus database, including scientific articles, book chapter reviews, books, and conferences, with the aim of obtaining a more comprehensive perspective on scientific production at the convergence of these areas.

To conduct a thorough analysis of the scientific landscape, publications from journals classified in the quartiles Q1, Q2, Q3, and Q4, according to the SCImago Journal Rank (SJR), were included. This strategy was adopted with the objective of encompassing the entirety of scientific contributions without restricting the scope of study to higher-impact journals. In this way, emerging research as well as works with varying levels of dissemination were incorporated, significantly enriching the bibliometric analysis performed.

In relation to the thematic areas addressed, priority was given to those linked to the arts and humanities, as well as engineering and computer science. This selection is grounded in the connection of these areas with the field of artificial intelligence and audiovisual production. However, with an inclusive approach, all areas of study were considered, thereby promoting interdisciplinarity and favouring the convergence of different perspectives that can enrich the research and analysis.

The refinement and filtering process progressively reduced the number of documents to 162, after which duplicate documents were removed. To ensure thematic relevance, the titles and abstracts of the publications were reviewed, and following a detailed and exhaustive selection, 61 publications were chosen, which form the final base of documents for the bibliometric analysis.

For the processing and bibliometric analysis of the data, use was made of the online tool Bibliometrix in R Studio, which allowed for a comprehensive and detailed study of the information to be conducted. The generation of scientific maps enabled the visualisation of connections between authors, contributing institutions, research themes, as well as the most prolific publication periods, providing a comprehensive overview of the scientific evolution in this field of study (Aria & Cuccurullo, 2017).

The findings were interpreted in accordance with the objectives set out, which facilitated the identification of trends in scientific production. Similarly, the periods of greatest research activity were highlighted, and the authors with the highest productivity, as well as the most influential institutions in the discipline, were analysed. Both the predominant thematic lines and those emerging in the field of artificial intelligence and audiovisual production were examined. Likewise, an analysis of collaboration networks among researchers was conducted, which allowed for the dynamics of international academic cooperation to be evidenced.

3. Results

Figure 1 presents a detailed analysis of the quality of the metadata obtained for the research. This analysis enables the evaluation of the completeness and reliability of the data extracted from the database used. The analysed metadata are classified into four categories based on their level of completeness: Excellent, Good, Acceptable, Poor, and Completely Absent. It is observed that the majority of essential metadata, such as Abstract, Affiliation, Author, Document Type, Journal, Language, Year of Publication, Title, and Total Citations, exhibit 100% completeness, indicating excellent quality in these fields.

DOI (Digital Object Identifier): With 4.92% missing values, it is classified as good, suggesting that the majority of documents have a DOI, though not entirely.

Keywords Plus: With 11.48% missing data, it is classified as acceptable, implying that the keyword information generated by the database is not fully available.

Keywords and Corresponding Author: These present missing values of 22.95% and 32.79%, respectively, placing them in the poor category, indicating a deficiency in the attribution of these metadata within the analysed database.

Cited References and Scientific Categories: With 100% missing data, these metadata are considered completely absent. This absence of information could be attributed to editorial policies or the specific characteristics of the database used. However, the high quality of the available metadata ensures a robust and reliable analysis.

Figure. 1 Metadata Quality Analysis for the Bibliometric Study of the Convergence between Artificial Intelligence and Audiovisual Production (2000–2024).

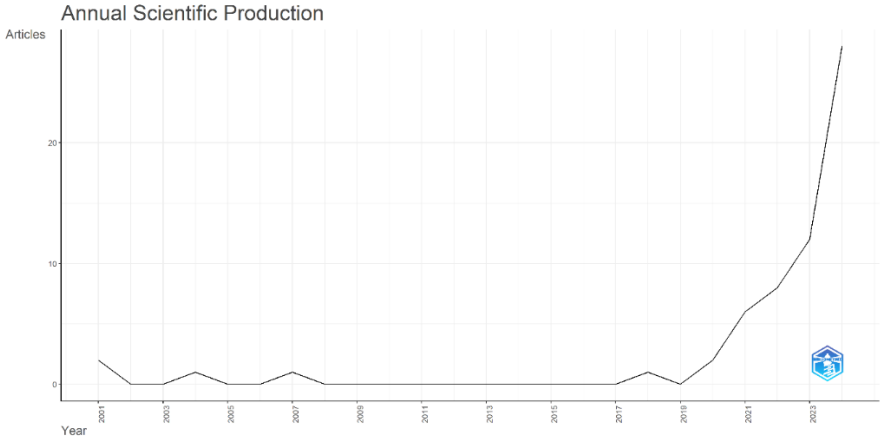
Metadata	Description	Missing Counts	Missing %	Status
AB	Abstract	0	0.00	Excellent
C1	Affiliation	0	0.00	Excellent
AU	Author	0	0.00	Excellent
DT	Document Type	0	0.00	Excellent
SO	Journal	0	0.00	Excellent
LA	Language	0	0.00	Excellent
PY	Publication Year	0	0.00	Excellent
TI	Title	0	0.00	Excellent
TC	Total Citation	0	0.00	Excellent
DI	DOI	3	4.92	Good
ID	Keywords Plus	7	11.48	Acceptable
DE	Keywords	14	22.95	Poor
RP	Corresponding Author	20	32.79	Poor
CR	Cited References	61	100.00	Completely missing
WC	Science Categories	61	100.00	Completely missing

Source: Own elaboration (2025), generated with Bibliometrix. (Aria & Cuccurullo, 2017).

Figure 2 reveals an exponential growth in scientific production in recent years, particularly from 2020 onwards, indicating an increase in the relevance of this research line. Between 2000 and 2015, production remains at very low levels, with values close to zero and occasional fluctuations with isolated publications.

From 2017, a slight increase in the number of publications is observed, suggesting an emerging interest in the relationship between artificial intelligence and audiovisual production. However, the true turning point occurs after 2019, when the number of publications begins to rise significantly, reaching its peak in 2023 and 2024.

Figure 2. Annual Evolution of Scientific Production on the Convergence between Artificial Intelligence and Audiovisual Production (2000–2024



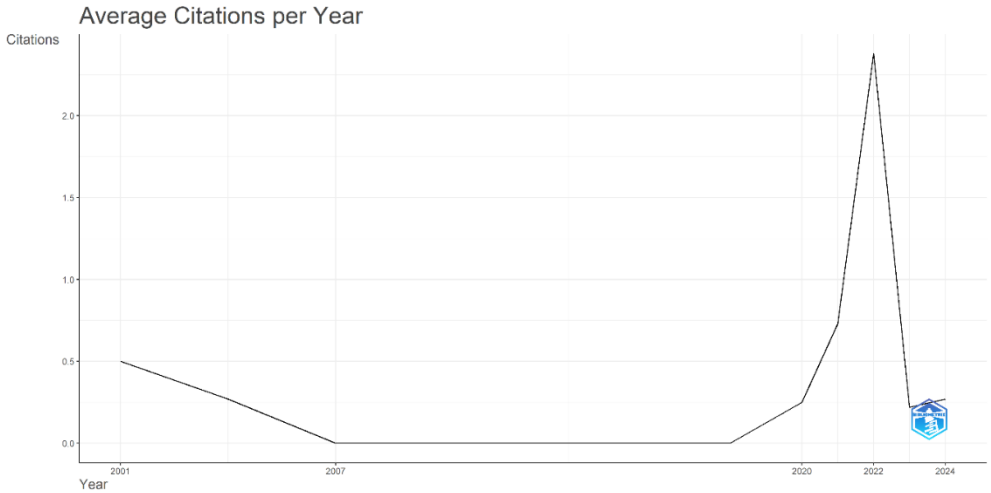
Source: Own elaboration (2025), generated with Bibliometrix.

Figure 3 illustrates the evolution of the average number of citations per year, enabling an assessment of the relevance and impact of studies in this field over time. For nearly two decades (2000–2019), the average number of citations per publication remained close to zero, indicating limited scientific production in this disciplinary intersection.

The progressive decline in citations during this period suggests that early publications failed to achieve significant impact within the academic community. A marked shift in the trend is observed after 2020, suggesting an increase in academic interest and scientific production in the application of AI to audiovisual production. The growth in citations is consistent with the emergence of new generative AI technologies, machine learning, deep learning, and automated tools in audiovisual production.

The average number of citations reaches its peak in 2022, with more than two citations per publication, indicating that studies published during this period had greater impact and visibility. This growth may be linked to the widespread adoption of AI in the film industry, animation, and visual effects, as well as global interest in generative AI models. In 2023–2024, a sharp decline in the average number of citations is observed, which can be explained by the short exposure time of recent studies, as newer publications require more time to accumulate citations.

Figure 3. Evolution of the Average Number of Citations per Year in Publications on the Convergence between Artificial Intelligence and Audiovisual Production (2000–2024).



Source. Own elaboration (2025), generated with Bibliometrix.

Figure 4 enables the identification of the main journals, conferences, and proceedings that have published research in this emerging field. The chart shows a heterogeneous distribution of publications, with a limited number of documents per source, suggesting that this research area is expanding and has not yet consolidated in specific journals or conferences. Nevertheless, certain sources stand out for their greater contribution:

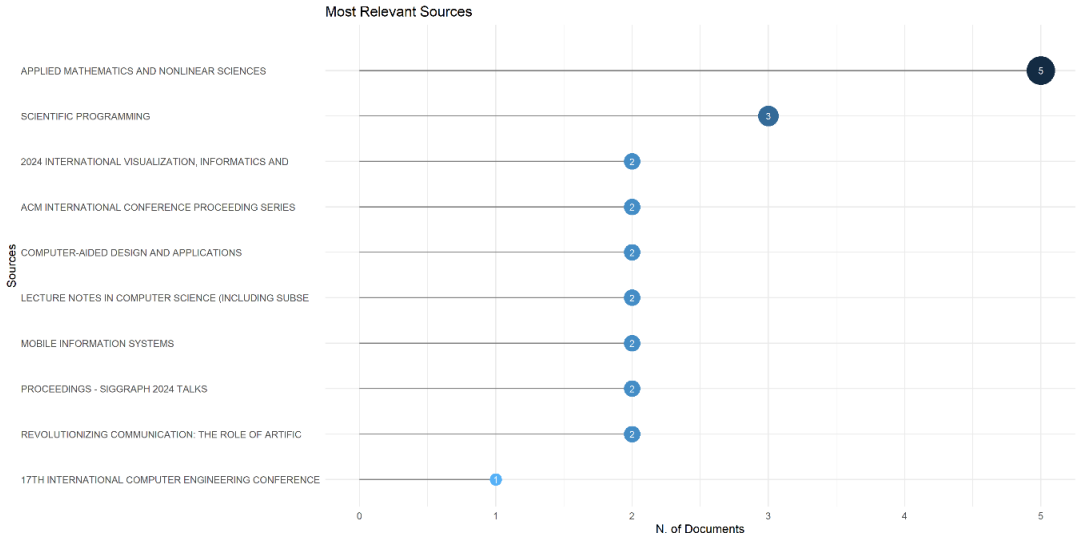
Applied Mathematics and Nonlinear Sciences emerges as the most influential source, with a total of 5 publications, indicating a strong focus on mathematical models and algorithms applied to artificial intelligence in the audiovisual context.

Scientific Programming follows in relevance with 3 documents, highlighting the role of scientific programming in the automation and optimisation of audiovisual processes through artificial intelligence.

Several sources present 2 publications each, including conferences and scientific journals related to data visualisation, applied computing, and computer-aided design, suggesting a growing interdisciplinarity in the study of AI applied to audiovisual production.

The analysis also underscores the importance of international conferences and symposia in disseminating knowledge in this field, such as SIGGRAPH 2024 Talks, a reference event in the computer graphics and interactive media industry, as well as the ACM International Conference Proceeding Series, which covers advanced research in artificial intelligence and computational applications, and likewise Lecture Notes in Computer Science, which has been historically significant in documenting advances in AI and data processing.

Figure 4. Most Relevant Sources in Research on the Convergence between Artificial Intelligence and Audiovisual Production (2000–2024).



Source: Own elaboration (2025), generated with Bibliometrix.

Figure 5 presents an analysis of the impact of the main publication sources at the intersection of artificial intelligence and audiovisual production, using the h-index as a metric. This indicator measures both the number of publications and their citation levels, providing insight into the relevance and influence of the sources in the scientific literature of the field.

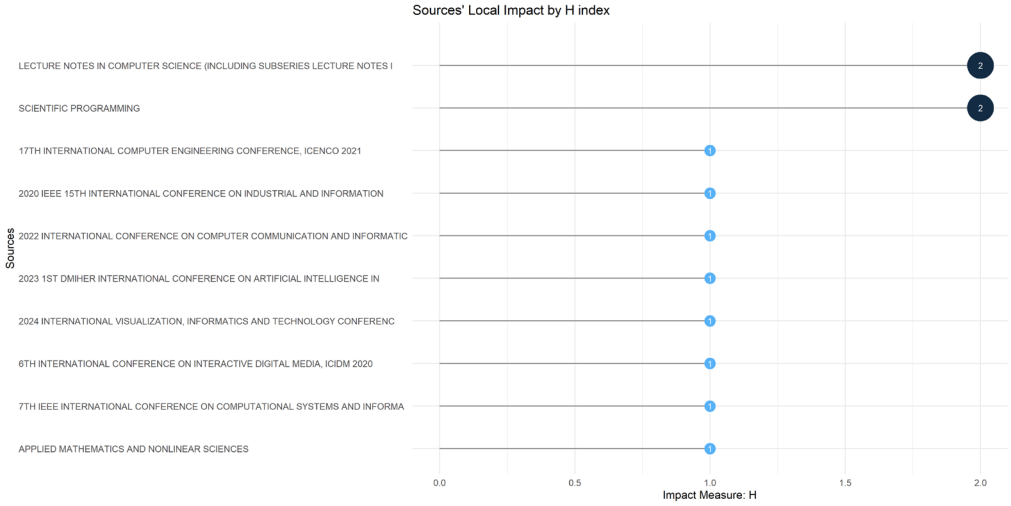
The analysis reveals that two sources lead the production with an h-index of 2: Lecture Notes in Computer Science (LNCS) and Scientific Programming. These sources have accumulated a higher number of citations compared to others, suggesting that the articles published in them have achieved greater dissemination and recognition within the academic community. Other relevant sources, though with a lower impact (h-index of 1), include conferences and journals specialised in computer engineering, artificial intelligence, digital media, and computational systems, such as: 17th International Computer Engineering Conference, 2020 IEEE 15th International Conference on Industrial and Information, 6th International Conference on Interactive Digital Media, and 2024 International Visualization, Informatics and Technology Conference.

The fact that the highest h-index is 2 indicates that research in this field is still in an emerging phase, with a dispersion of publications across various sources without a clear dominance by a specific journal

or conference. However, the presence of LNCS and Scientific Programming suggests that studies in this area have a strong foundation in applied computing and algorithm development.

On the other hand, the prominence of international conferences within the ranking confirms the significance of specialised events in artificial intelligence, digital media, and interactive computing as key forums for the dissemination of knowledge in this domain.

Figure 5. Sources with the Highest Impact Measured by the h-Index in Research on the Convergence between Artificial Intelligence and Audiovisual Production (2000–2024).

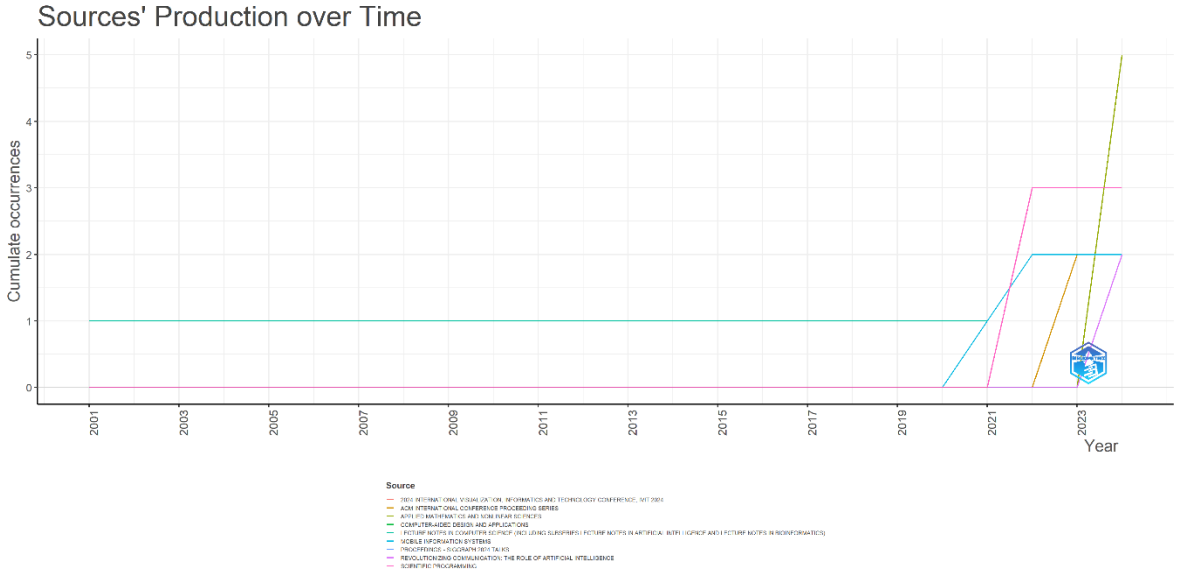


Source: Own elaboration (2025), generated with Bibliometrix.

Figure 6 enables the identification of growth and consolidation patterns in the literature within this field. Until 2019, the cumulative production in most sources remained virtually stagnant, with few publications in this area. From 2020 onwards, a notable increase in the number of documents published across various sources is observed, suggesting a significant rise in academic and scientific interest in the field of study.

Between 2021 and 2023, several sources experienced accelerated growth in their cumulative production, with journals such as Scientific Programming, Lecture Notes in Computer Science, Proceedings - SIGGRAPH 2024 Talks, and 2024 International Visualization, Informatics and Technology Conference standing out. These sources have consolidated their presence in the publication of relevant articles in this emerging field.

Figure 6. Cumulative Production of Sources in Research on the Convergence between Artificial Intelligence and Audiovisual Production (2000–2024)



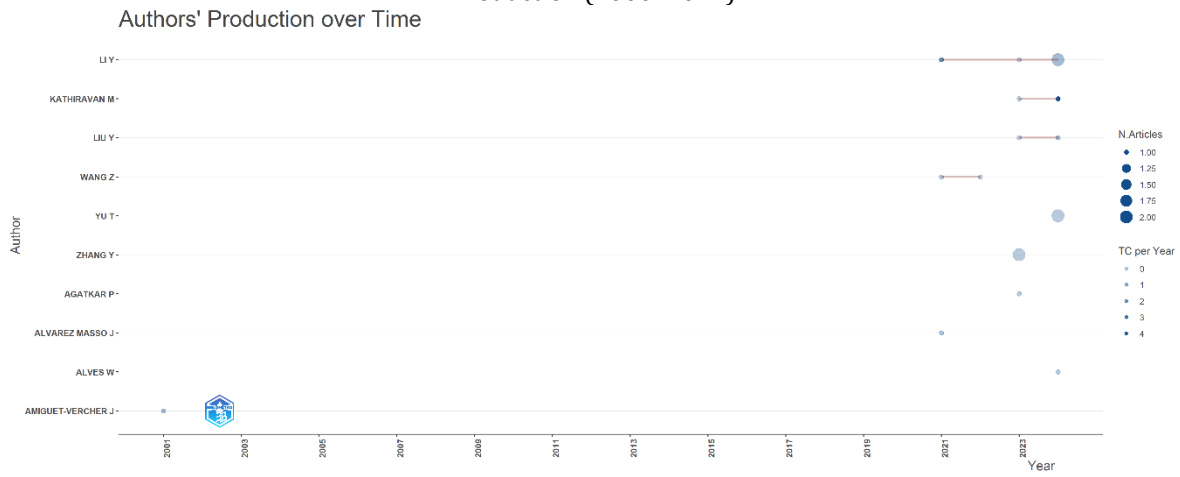
Source: Own elaboration (2025), generated with Bibliometrix.

Regarding the most prolific authors, Figure 7 shows dispersed activity until 2020. During the first two decades of the analysed period, scientific production in this field was scarce, with few authors

contributing to the literature. It is observed that some researchers, such as Amiguet-Vercher J, published in the early years but without continuity in their output. However, from 2021 onwards, there was a significant increase, with the number of active authors rising, indicating greater interest in the convergence between AI and audiovisual production.

Li Y stands out as the author with the highest cumulative production, with up to 2 publications and a considerable number of citations per year. Other authors, such as Wang Z, Yu T, and Zhang Y, have shown recent activity with publications in the last few years, suggesting growth in the research community.

Figure 7. Author Production in Research on the Convergence between Artificial Intelligence and Audiovisual Production (2000–2024).



Source: Own elaboration (2025), generated with Bibliometrix.

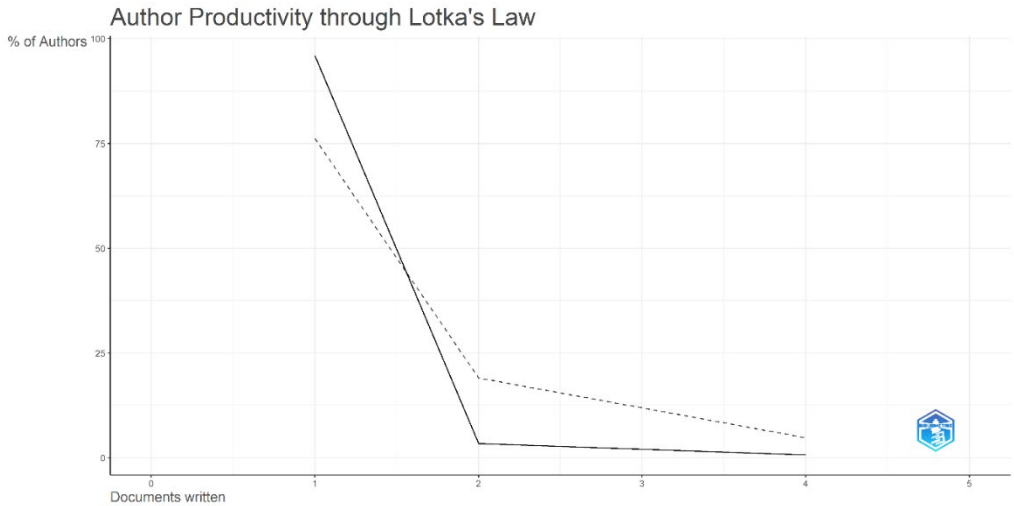
The chart presented analyses author productivity in the field of study using Lotka's Law, a commonly employed bibliometric principle to measure the distribution of author productivity in a research area.

Figure 8 shows that a large proportion of authors (approximately more than 75%) have published only one document, indicating that scientific production in this field is dominated by occasional researchers.

The number of authors decreases sharply as the number of publications increases, following Lotka's pattern: only a few authors contribute multiple documents.

The solid line represents the observed distribution, while the dashed line represents the theoretical distribution expected according to Lotka's Law. It is observed that the empirical distribution follows the expected trend, confirming that research in this area is dispersed and involves few highly productive authors.

Figure 8: Author Productivity in Research on the Convergence between Artificial Intelligence and Audiovisual Production According to Lotka's Law (2000–2024).



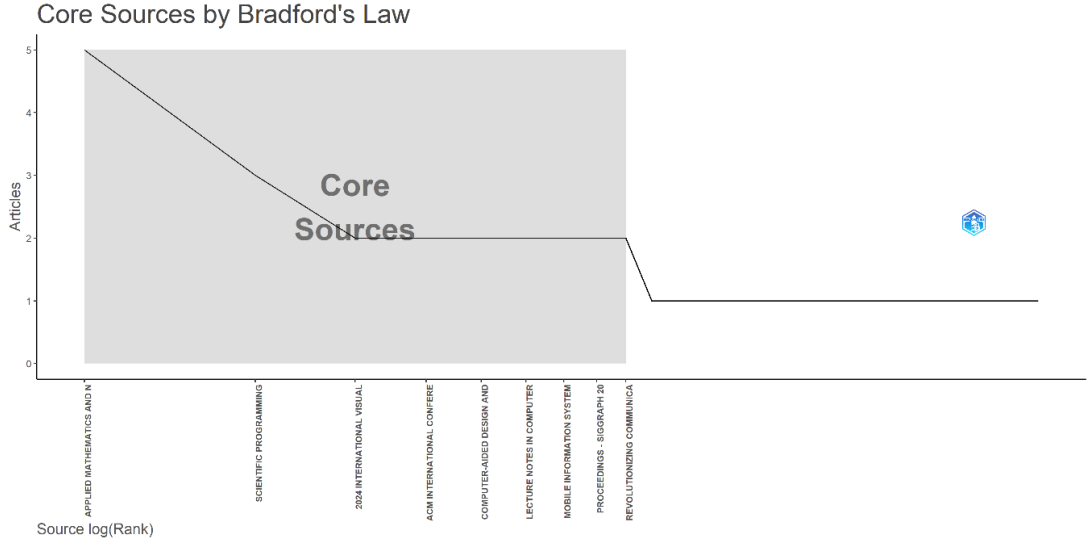
Source: Own elaboration (2025), generated with Bibliometrix.

Figure 9 presents the analysis of key publication sources in the field, using Bradford's Law as the evaluation criterion. This model classifies journals into zones based on their productivity. The journals

that concentrate the largest number of relevant publications in the field of study are termed the core source zone, while the remaining literature is distributed across zones with lower publication frequency.

The shaded region in the chart represents the core zone, i.e., those sources that publish the highest number of articles in this field. In this case, it is observed that Applied Mathematics and Nonlinear Sciences and Scientific Programming are the sources with the highest number of articles, suggesting they have been the primary channels for disseminating studies on the convergence between artificial intelligence and audiovisual production. Other sources, such as ACM International Conference Proceedings Series and Lecture Notes in Computer Science, also appear within this core, indicating their relevance in disseminating research in this interdisciplinary field.

Figure 9. Key Sources in Research on the Convergence between Artificial Intelligence and Audiovisual Production According to Bradford's Law (2000–2024).



Source: Own elaboration (2025), generated with Bibliometrix.

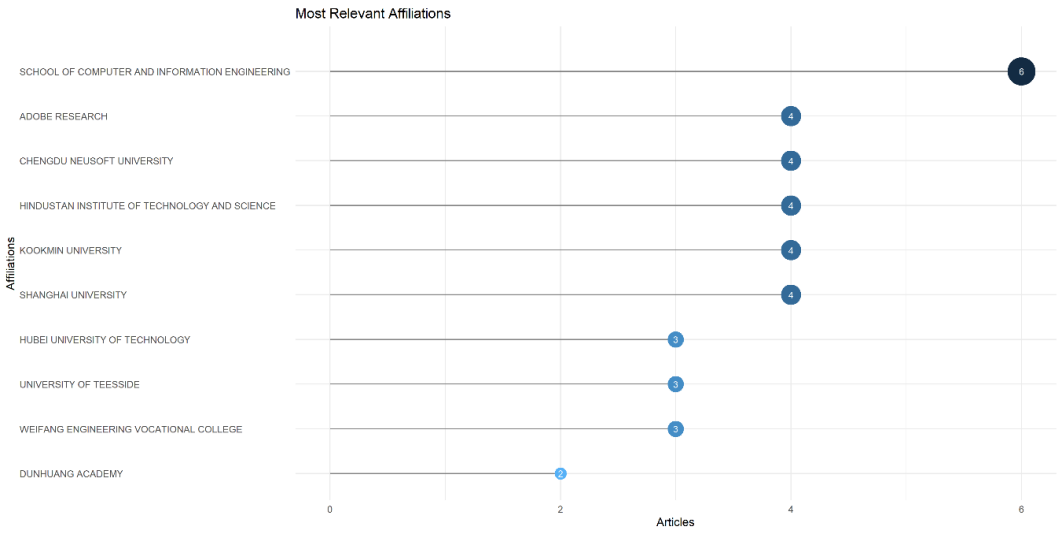
Regarding institutional affiliations, Figure 10 shows that the School of Computer and Information Engineering, with six publications, stands out as the institution with the highest number of research outputs, indicating a strong focus on the application of AI to audiovisual production within an academic context.

Other institutions with significant production, each with four publications, include Adobe Research, suggesting a high level of interest from the private sector in the research and development of AI-based technologies for audiovisual production; Chengdu Neusoft University, a technology-focused university with a strong presence in computational research; Hindustan Institute of Technology and Science, indicating the participation of institutions in emerging regions in AI applied research; and Kookmin University and Shanghai University, both with a notable presence in technological and digital research.

Other universities and research centres have contributed three articles, such as Hubei University of Technology, University of Teesside, and Weifang Engineering Vocational College.

Finally, the Dunhuang Academy appears with two publications, suggesting that institutions dedicated to culture and the arts are also exploring the intersection between AI and audiovisual production.

Figure 10. Most Relevant Affiliations in Research on the Convergence between Artificial Intelligence and Audiovisual Production (2000–2024).



Source: Own elaboration (2025), generated with Bibliometrix.

Figure 11 analyses the contribution by countries, where China leads significantly in scientific production with a total of 76 publications, establishing itself as the country with the greatest impact at the intersection of AI and audiovisual production.

India ranks second with 23 publications, showing significant growth in this area.

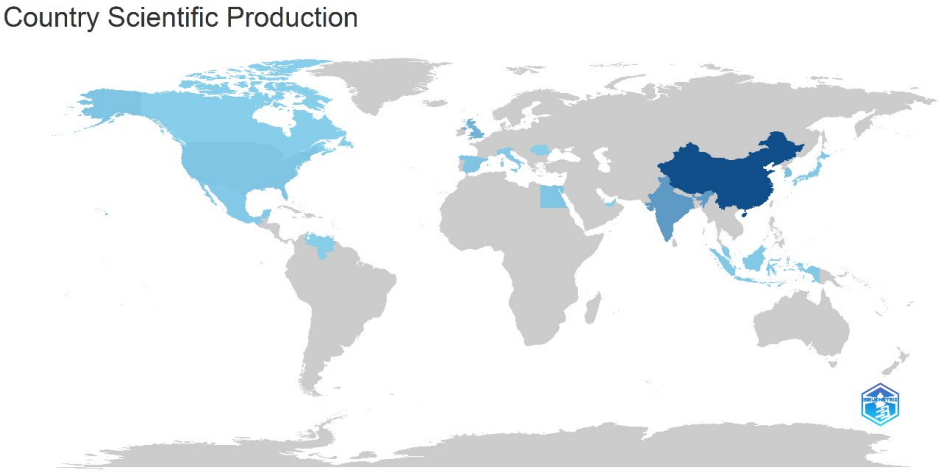
South Korea holds the third position with 12 publications, reflecting its interest in technological development applied to audiovisual production.

The United Kingdom and the United States exhibit a similar level of production, with 9 publications each, highlighting their contribution to this emerging field.

Malaysia, with 7 publications, Egypt, with 6 publications, and Spain, with 6 publications, are also among the countries with moderate scientific production in this domain.

Other countries with smaller contributions include Indonesia with 5 publications, Italy with 4 publications, Japan with 4 publications, Mexico with 4 publications, and Morocco, Austria, Canada, and the United Arab Emirates, each with 2 publications.

Figure 11. Scientific Production by Country on the Convergence between Artificial Intelligence and Audiovisual Production (2000–2024).



Source: Own elaboration (2025), generated with Bibliometrix.

Figure 12 presents an analysis of the most globally cited documents in research on artificial intelligence applied to audiovisual production, based on data generated with Bibliometrix. This analysis identifies the studies that have had the greatest impact within the scientific community, evaluating their level of influence on the development of the field.

The most globally cited documents are presented in Figure 12. The most cited document is Liu X (2022), published in Scientific Programming, with 46 citations, positioning it as the most influential study at the intersection of AI and audiovisual production.

Other documents with a high number of citations include:

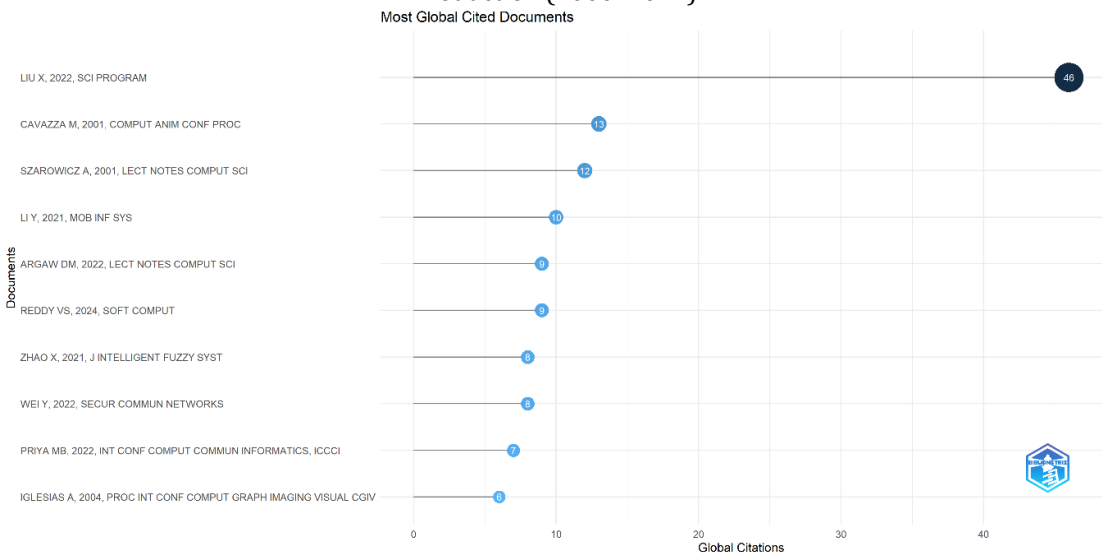
Cavazza M, 2001, published in Comput Anim Conf Proc, with 13 citations.

Szarowicz A, 2001, published in Lecture Notes in Computer Science, with 12 citations.

Li Y, 2021, published in Mobile Information Systems, with 10 citations.

These articles have played a key role in the dissemination of knowledge and have been widely referenced in subsequent research.

Figure 12. Most Globally Cited Documents on the Convergence between Artificial Intelligence and Audiovisual Production (2000–2024)



Source: Own elaboration (2025), generated with Bibliometrix.

Figure 13 illustrates the evolution of the frequency of keywords in the scientific literature related to the field of study. This analysis enables the identification of thematic trends and the growing interest in specific concepts over time.

Until 2017, most terms exhibited a low and stable frequency, suggesting that the field had limited and dispersed scientific production. From 2019 onwards, a progressive increase in the occurrence of certain keywords is observed, indicating greater interest in this disciplinary intersection. From 2021 onwards, the frequency of some keywords has experienced exponential growth, particularly terms related to artificial intelligence and emerging technologies.

The terms with the greatest presence in recent literature include:

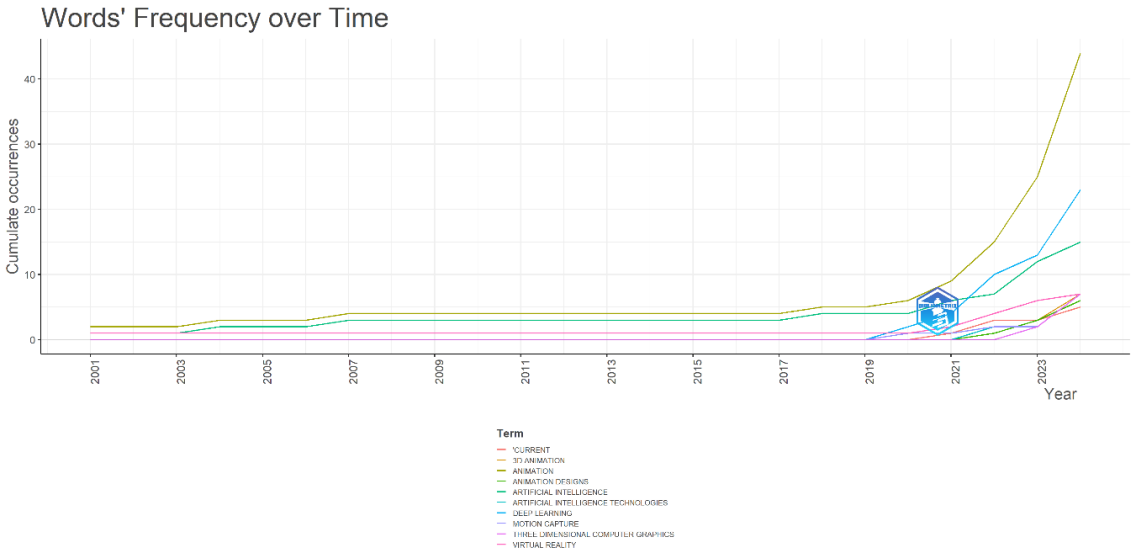
Artificial Intelligence and Artificial Intelligence Technologies → These show the most pronounced growth after 2020, establishing themselves as the central focus of research in this field.

Deep Learning → Reflects the rise of advanced machine learning techniques applied to audiovisual production.

3D Animation and Motion Capture → Their frequency has increased significantly, indicating the growing application of artificial intelligence in animation and motion capture.

Virtual Reality and Three-Dimensional Computer Graphics → These have gained relevance in recent years, reflecting the convergence between AI and virtual reality environments and computational imagery.

Figure 13. Frequency of Keywords in Research on the Convergence between Artificial Intelligence and Audiovisual Production (2000–2024).



Source: Own elaboration (2025), generated with Bibliometrix.

Figure 14 illustrates the temporal evolution of emerging themes in recent scientific literature.

Artificial Intelligence is the most frequent term with the longest trajectory in research, showing sustained growth since 2020 and establishing itself as the core of this field of study.

Deep Learning has gained prominence in recent publications, indicating its significance in the automation and optimisation of processes in audiovisual production.

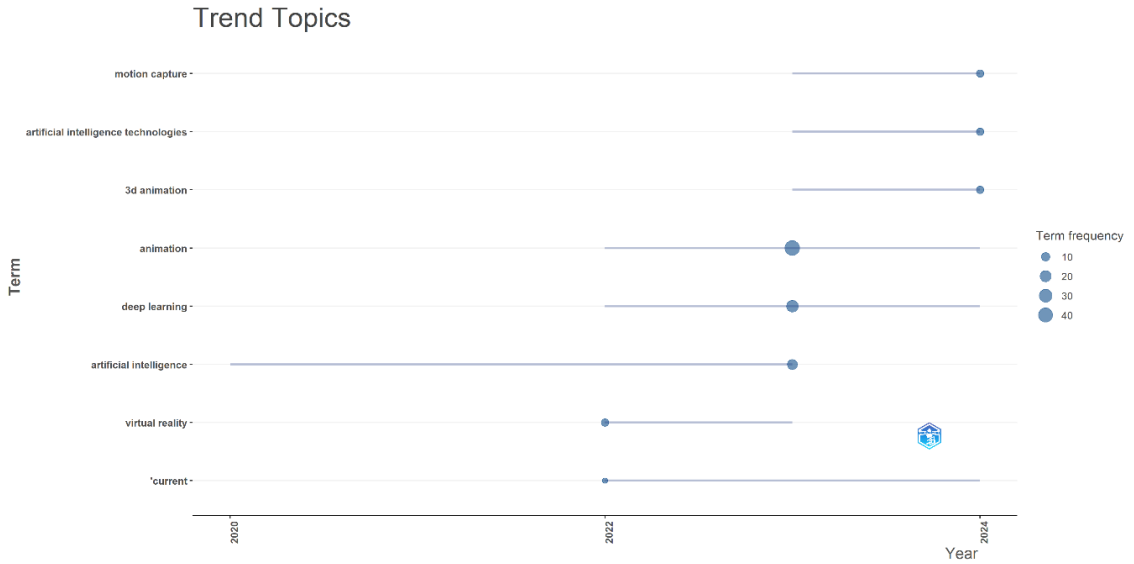
Animation and 3D Animation have shown notable growth in recent years, highlighting the role of artificial intelligence in the generation of animated content and the evolution of 3D animation techniques.

Artificial Intelligence Technologies reflects the interest in specific AI technologies applied to audiovisual production, including machine learning, neural networks, and automated content generation.

Motion Capture has emerged as one of the most relevant applications of AI in the entertainment and digital production industry, with an increase in its frequency in recent years.

Virtual Reality, although less prevalent compared to other terms, has shown steady growth, suggesting that its integration with artificial intelligence is in development.

Figure 14. Emerging Themes in Research on the Convergence between Artificial Intelligence and Audiovisual Production (2000–2024).



Source: Own elaboration (2025), generated with Bibliometrix.

Figure 15: Term Co-occurrence Map illustrates the interrelation between the most relevant keywords. "Animation" is the central and largest node, indicating that the majority of studies in this field are related to digital animation and the use of AI in its development.

"Artificial Intelligence" appears as a significant node connected to multiple terms, establishing itself as the transversal axis in this disciplinary convergence.

Several thematic clusters are observed, each representing specific research areas within the field:

Artificial Intelligence and Data Processing Cluster

Includes terms such as "artificial intelligence", "decision making", "efficiency", and "virtual reality technology", suggesting a focus on the use of AI to enhance audiovisual production and process optimisation.

Machine Learning and Visual Effects Cluster

Contains terms like "machine learning", "computer vision", "visual effects", and "film industry", indicating the key role of computer vision and machine learning in post-production and the generation of visual effects.

Neural Networks and Automated Generation Cluster

Highlights the use of neural networks in audiovisual production with terms such as "generative adversarial networks", "convolutional neural networks", and "adversarial machine learning", suggesting the growth of generative models in digital content creation.

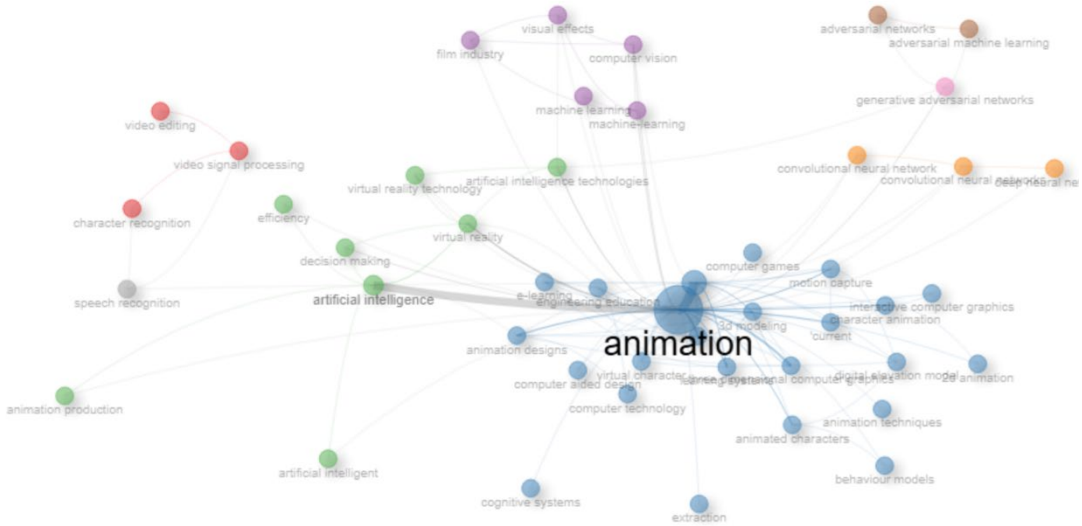
Audiovisual Production and Interactive Animation Cluster

Includes terms like "motion capture", "character animation", "interactive computer graphics", and "3D modeling", reflecting the use of AI in character animation and three-dimensional modelling.

Editing and Image Recognition Cluster (red)

Encompasses terms such as "video editing", "video signal processing", "character recognition", and "speech recognition", indicating the application of AI in automated editing and pattern recognition in audio and video.

Figure 15: Term Co-occurrence Network in Research on the Convergence between Artificial Intelligence and Audiovisual Production (2000–2024).



Source: Own elaboration (2025), generated with Bibliometrix.

Figure 16 presents a thematic map of the research, which enables the identification of the main thematic axes in the field, classifying them according to their relevance (centrality) and degree of development (density). The map divides the themes into four quadrants, each with distinct characteristics based on their level of importance and maturity in the scientific literature.

1. Motor Themes

These are highly developed and central themes to the field of study. They represent key areas with significant impact on scientific production and strong interconnection with other terms.

"Animation", "Deep Learning", and "3D Animation" confirm that AI is having a pivotal impact on digital animation and the automated generation of audiovisual content.

"Machine Learning", "Computer Vision", and "Visual Effects" demonstrate that machine learning and computer vision techniques are fundamental in post-production and the creation of visual effects.

These themes are highly relevant and will continue to be central research areas in the coming years.

2. Basic Themes

These are fundamental concepts for the field, with high relevance but a lower degree of development. They represent essential areas that still have potential to evolve in terms of research.

"Artificial Intelligence", "Artificial Intelligence Technologies", and "Virtual Reality" are key themes in the convergence between AI and audiovisual production, with potential for further expansion.

"Video Editing", "Feature Extraction", and "Semantics" indicate that AI is being used in editing and information extraction in audiovisual post-production.

3. Niche Themes

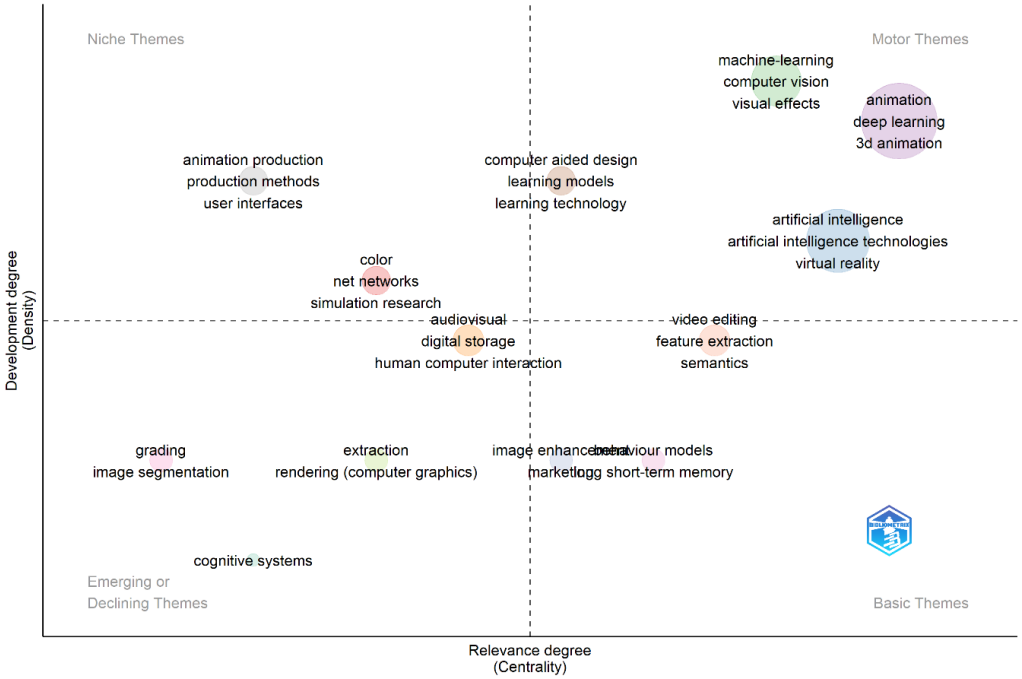
These are themes with a high degree of development (density) but low centrality, meaning they are specialised areas with a more specific focus within the field.

"Animation Production", "Production Methods", and "User Interfaces" relate to the use of AI in the automation of animated production and interaction in digital interfaces.

"Computer Aided Design" and "Learning Models" indicate that computer-aided design and learning models are being explored in audiovisual production, though with less global impact.

These themes may represent emerging or specialised areas with more segmented growth in the scientific literature.

Figure 16. Thematic Diagram in Research on the Convergence between Artificial Intelligence and Audiovisual Production (2000–2024).



Source: Own elaboration (2025), generated with Bibliometrix.

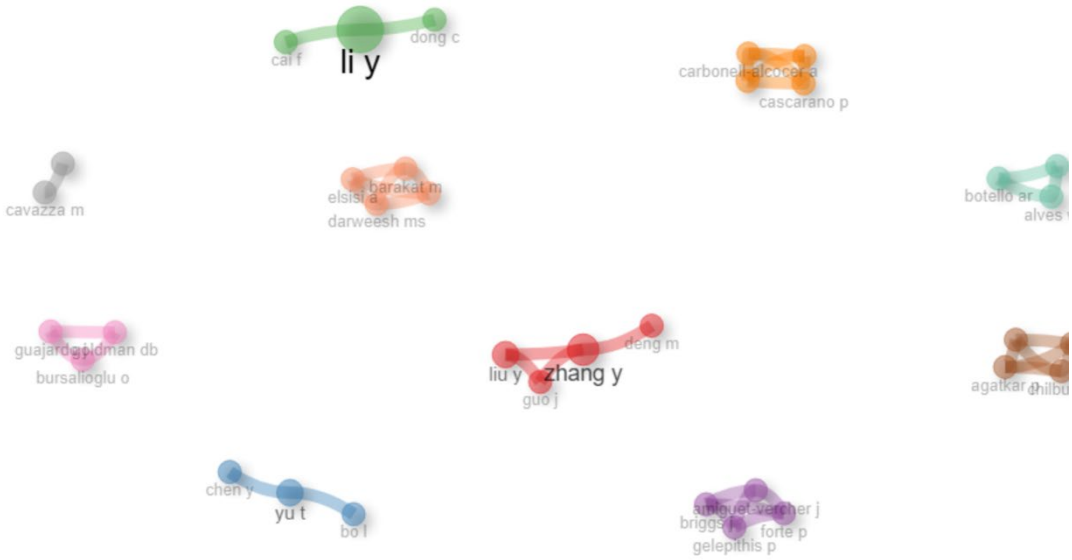
The collaboration networks presented in Figure 17 show that the author with the greatest centrality and collaboration is "Li Y", who is connected with multiple co-authors (Cai F and Dong C), indicating participation in several joint publications.

Another relevant group is formed by "Zhang Y", "Liu Y", and "Deng M", suggesting recurring cooperation in research on AI and audiovisual production.

"Yu T" and their network (Chen Y, Bo L) also exhibit notable collaboration, though with fewer connections than the groups mentioned above.

Additionally, it is evident that there are several small co-authorship networks without a global connection among all researchers. This suggests that collaboration in this field is still in the process of consolidation.

Figure 17: Collaboration Networks in Research on the Convergence between Artificial Intelligence and Audiovisual Production (2000–2024).



Source: Own elaboration (2025), generated with Bibliometrix.

4. Discussion

The results of the bibliometric analysis spanning the years 2000 to 2024 indicate exponential growth in scientific production concerning artificial intelligence (AI) and its application across various stages of audiovisual production, with a significant increase in publications from 2020 onwards. This surge can be attributed to advancements in machine learning, deep learning, and neural networks, which have facilitated the development of innovative applications in the audiovisual industry, ranging from automated content generation, such as scriptwriting, to the creation and enhancement of images, videos, and audio through generative AI algorithms.

The year 2019 marks a turning point in the volume of publications identified on this topic, coinciding with trends reported in related fields, such as AI in education (Reyes Flores & Mejía Rivera, 2024). Furthermore, the democratisation of digital tools such as OpenAI, DeepMind, Adobe Sensei, and Runway has facilitated access to these new technologies and their adoption within the audiovisual industry.

The rise of streaming as a consumption model has also driven increased research into AI-based recommendation algorithms applied to entertainment, content personalisation, and distribution. Albores (2022) suggests that the pandemic accelerated the adoption of these technologies, which may have further spurred scientific production in these areas. Additionally, the author highlights that audiovisual content distribution platforms not only predict consumption but also influence content creation, optimising offerings based on user behaviour. This aspect is pivotal in the evolution of audiovisual production, as it signals a trend where AI not only distributes content but also begins to shape the production process itself.

Moreover, the high co-occurrence of terms such as “animation”, “deep learning”, and “motion capture” suggests that the primary applications of AI in audiovisual production are related to digital animation, 3D modelling, and motion capture. Lungu-Stan and Mocanu (2024) note that, in the post-production phase, AI has advanced automation in animation and audiovisual content production. Key areas of innovation include automatic motion generation, noise correction in motion capture data, and the use of diffusion models for generating detailed visual environments. This trend indicates that AI not only facilitates the creation of animated content but also redefines creative and technical processes in 3D animation, such as concept generation, storyboarding, and the simplification of character modelling and rigging processes, establishing itself as a key factor in the evolution of contemporary audiovisual production (Chen et al., 2024).

The analysis of scientific production by country confirms that research in this field is highly concentrated in China, followed by India and South Korea. This geographical diversification indicates that this is a globally growing field. Additionally, the emerging participation of regions such as Egypt and Morocco suggests an internationalisation that may pave the way for new collaborations in the future.

(Casas Arias et al., 2024) argue that the integration of AI with audiovisual production is emerging as a critical synergy for the sustainable development of the industry. Recent studies highlight how these technologies optimise workflows, particularly in image and video generation through AI applications such as Midjourney, Stable Diffusion, and DALL-E. Beyond automating post-production tasks like background removal, resolution enhancement, and image stylisation, AI also aids in text-based audiovisual content synthesis, with an emphasis on creative exploration and accessibility.

The increase in citations post-2020 indicates that research on AI and audiovisual production has transitioned from an emerging topic to a consolidated field. The high citation rate in 2022 suggests that certain key articles have significantly influenced the field, establishing relevant theoretical and methodological foundations.

The author collaboration network reveals frequent collaboration, with Li Y as a central figure, working with co-authors such as Cai F and Dong C. The names within the network suggest that authors come from diverse regions and areas of expertise, reflecting an interdisciplinary approach in the field. Another significant group comprises Zhang Y, Liu Y, and Deng M, indicating the formation of robust research groups that may shape the direction and focus of future studies.

The study reveals that, in line with Lotka's Law, approximately 75% of authors have contributed only one document, indicating that scientific production in this field is dominated by occasional researchers. This dispersion suggests that research on AI and audiovisual production lacks a consolidated community of experts, a situation observed in other AI-related fields.

Institutions such as the School of Computer and Information Engineering, Adobe Research, Chengdu Neusoft University, Hindustan Institute of Technology and Science, Kookmin University, and Shanghai University have had a significant impact in this field. Notably, the School of Computer and Information Engineering stands out for its recognised expertise and strength in technology and engineering. The presence of Adobe Research among the leading affiliations reinforces the notion that research in AI applied to audiovisual production is becoming increasingly relevant not only in academia but also in industry.

The analysis based on Bradford's Law confirms that a few sources concentrate the majority of publications, establishing Applied Mathematics and Nonlinear Sciences and Scientific Programming as core sources in knowledge dissemination. The fragmentation of literature across multiple sources with limited publications may lead to knowledge dispersion, underscoring the need for specialised journals in AI and audiovisual production. Based on the above, it is suggested that future research adopt broader collaborative approaches and foster stable academic networks to enable the development of a more cohesive research community. The promotion of research consortia and interdisciplinary collaboration constitutes a fundamental strategy for strengthening the development of this field (Suárez Manrique & De León Vargas, 2019).

5. Conclusions

This bibliometric analysis has provided a comprehensive overview of the evolution and current state of the convergence between artificial intelligence (AI) and audiovisual production from 2000 to 2024. The findings indicate exponential growth in scientific production from 2020 onwards, with the highest peaks in 2023 and 2024. This pattern suggests that this field of study has transitioned from an emerging topic to a consolidated area of research at the intersection of technology and creativity. It is anticipated that scientific production in this field will continue to rise, with an increasingly specialised focus on areas such as augmented reality, animation, synthetic content generation, automated video editing, and the personalisation of audiovisual experiences through AI.

Additionally, the analysis identifies China as the primary contributor to scientific production, followed by India and South Korea. This geographical diversification indicates that this is a globally expanding field, highlighting opportunities for future international collaborations. The School of Computer and Information Engineering stands out as the most prolific institution in this area of study.

The analysis of keywords reveals a trend towards themes such as animation, deep learning, and 3D animation, confirming a shift towards the integration of AI with digital animation techniques, motion capture, and automated content generation. The emergence of these areas opens new perspectives for innovation and development in the field.

One of the most significant aspects of this evolution is how AI directly influences content creation, optimising offerings based on user behaviour. This trend signals a fundamental shift, where artificial

intelligence not only predicts consumption patterns but also begins to guide and shape the creation of new audiovisual productions, establishing new dynamics within the industry.

Scientific production in this area has progressed from a latent state to a phase of accelerated growth, indicating its consolidation as an interdisciplinary research field with impact on the entertainment industry, cinema, and digital audiovisual post-production. This upward trend is expected to continue, with a growing number of publications in specialised journals and conferences.

In conclusion, the revolution driven by AI is radically transforming various aspects of audiovisual production. Among the most significant is the post-production stage, where the implementation of AI tools enables automated video editing, assisted colour correction, visual effects generation, and generative video extension. Similarly, in the scripting and pre-production phases, AI facilitates the generation of ideas, synopses, or preliminary narrative structures. In the realm of sound production, AI systems are capable of generating music, Foley effects, and highly realistic synthesised voices. Furthermore, AI also impacts distribution and audience segmentation through predictive algorithms that optimise content reach based on audience preferences.

Looking to the future, AI is expected to transform emerging areas of audiovisual production, such as the direction of virtual actors, automated design of digital sets, predictive script evaluation, automated editing, and the generation of promotional campaigns tailored to specific audiences.

By understanding the impact of AI on audiovisual production and the unprecedented pace of technological advancement, we can anticipate future changes and trends in how audiovisual content is conceived, produced, and distributed. This convergence is of vital importance for industry professionals, educators, and academics seeking to fully harness technological, artistic, and commercial possibilities to develop new working methodologies, enhance efficiency in audiovisual content creation, and enrich the field of study with research that integrates these emerging technologies into the existing academic corpus. In this sense, audiovisual production emerges as a fertile ground for interdisciplinary research involving artificial intelligence, communication, art, and technology, contributing to the advancement of knowledge and the evolution of the industry.

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