



DIGITAL TECHNOLOGIES AND ARTIFICIAL INTELLIGENCE: REDEFINING THE CINEMA EXPERIENCE

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Abstract : The current study aims to explore artificial intelligence applications in the film industry, focusing on how they enhance production processes and creative strategies. Artificial intelligence facilitates the creation of advanced scenarios and efficient production management through data analysis and machine learning. Technologies such as virtual reality and animation leverage AI to produce sophisticated visual and auditory effects that enhance creativity and realism. AI is also utilized in marketing and distribution strategies to improve audience targeting and promotional effectiveness. Therefore, artificial intelligence plays a crucial role in enhancing film quality and attracting attention, thereby fostering the overall development of the film industry.

Keywords : Artificial Intelligence, Film Industry, Mechanisms, Impacts

LES TECHNOLOGIES NUMERIQUES ET L INTELLIGENCE ARTIFICIELLE : REDEINIR EXPERIENCE CINEMATOGRAPHIQUE

Résumé La présente étude vise à explorer les applications de intelligence artificiel dans l'industrie cinématographique, en mettant l'accent sur la manière don't ells améliorent les processus de production et les stratégies créatives. L'intelligence artificielle facilite la création de scénarios avancés et la gestion efficace de la production grâce à l'analyse des données et à l'apprentissage automatique. Des technologies telles que la réalité virtuelle et l'animation exploitent l'IA pour produire des effets visuels et sonores sophistiqués qui renforcent la créativité et le réalisme. L'IA est également utilisée dans les stratégies de marketing et de distribution pour améliorer le ciblage du public et l'efficacité promotionnelle. Par conséquent, l'intelligence artificielle joue un rôle crucial dans l'amélioration de la qualité des films et dans l'attraction de l'attention, favorisant ainsi le développement global de l'industrie cinématographique.

Mots-clés : Intelligence artificielle, Industrie cinématographique, Mécanismes, Impacts

Introduction:

Artificial intelligence (AI) technologies are among the leading innovations in the film industry, witnessing significant advancements in production mechanisms and film effects. Filmmakers benefit from these technologies to speed up production processes and improve the quality of animation and visual effects. AI enables automatic enhancement of filming and video editing, helps in developing virtual characters, and achieves creative effects. These technologies

also allow directors and producers to explore new ideas, enriching the cinematic work in unprecedented ways.

Considering the challenges and potential concerns related to the deployment of AI in the film industry, including privacy issues and its impact on traditional cinema art, we look towards the future to see how AI's role might evolve to enhance creativity and innovation in films. We will present examples of how AI has been successfully used in specific film productions to provide a comprehensive assessment of the benefits and challenges of employing AI in the film industry, highlighting innovative and future aspects.

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1. Study Problem

Today, most media institutions, regardless of their ideology, strive to adapt to various technological developments to enhance and facilitate media practices. They rely on all available tools to achieve this fundamental goal, playing a pivotal role where the efforts of diverse media channels—be it visual, written, auditory, or digital—intersect based on what information and communication technologies offer. There is no doubt that these technologies have provided advancements that allow media institutions to overcome issues of dissemination, popularity, and interactivity. However, providing a diverse and precisely tailored mix according to the tastes of each group has remained an elusive goal, prompting the need to seek new alternatives that fulfill the desired purpose. Hence, the current focus is on AI technologies, which are both old in concept and new in practice, ensuring their seamless application in key media tasks, particularly in automated data processing and audience data analysis, leading up to film production and related activities. These features have largely succeeded in establishing a culture of new services that previously required complete tams.

From this perspective, we pose a primary question:

What is the impact of employing AI applications in the film industry?

This leads us to several questions regarding media and AI:

- What do we mean by artificial intelligence?
- Has the film art benefited from using artificial intelligence?
- What role have AI tools and applications played in film work?
- What are the risks and challenges posed by AI to the cinematic art?

1.1. Study Objectives:

- To demonstrate how AI technologies can improve production processes, such as enhancing cinematography, improving computer graphics, and editing processes.
- To highlight the role of AI in assisting screenwriters in generating new ideas or analyzing scripts to improve the screenplay.

- To improve the viewing experience by personalizing content and providing accurate recommendations to viewers.

1.2. Study Importance

The study of employing AI in the film industry is of great significance as it sheds light on potential artistic and economic transformations. Understanding the impact of these technologies helps in effectively utilizing them without negatively affecting human creativity. Such studies support the development of sustainable industrial policies and enhance the balance between technological advancement and the preservation of artistic and cultural aspects in the field of cinema.

1.3. Research Methodology

This study falls within descriptive research aimed at answering the questions posed by the research problem by collecting information and data directly related to the study's subject, revealing the relationships between its variables, and identifying the interactions and influences resulting from them. Given that the current research concerns a phenomenon that has not yet been fully scientifically and conceptually described and systematically organized, along with the scarcity of studies and research on AI in filmmaking due to its novelty and the need for sufficient knowledge and information to understand it, it was necessary to employ a forecasting or future prediction approach. This involves an analytical reading of the phenomenon in the present and predicting its future developments and implications. The study envisions a reading of the modern concepts of smart cinema through the digital transformation of roles and how to automate elements of the communication process.

A number of films that used artificial intelligence (AI) technologies in various stages of production were examined. The survey covered 10 diverse films, ranging from feature films, animated films, to anime, providing a comprehensive view of how AI is utilized in different areas of the film industry. These films were selected based on specific criteria, including the diversity of genres and their tangible use of modern technologies like AI in visual effects, screenwriting, and editing. Among the films surveyed are *The Lion King* (2019), which used AI to simulate realistic movement, and *Avengers: Endgame* (2019), where AI techniques were applied to create advanced digital characters. The survey also included anime films like *Ghost in the Shell* (2017), which benefited from AI in processing special effects. These films were chosen due to their significant impact on the film industry and their representation of technological advancements in the field.

The survey was conducted from the beginning of September to the end of November 2024, analyzing the films in the context of their use of AI technologies, with a focus on how these technologies impact production, artistic creativity, and other technical aspects. This time period was chosen to ensure the collection of recent data on the latest uses of AI in the film industry, along with an analysis of the developments and trends that have emerged during this period.

2. Concept of Artificial Intelligence

Artificial intelligence (AI) refers to specific behaviors and characteristics exhibited by computer programs that mimic human cognitive abilities and their patterns of work. Among the most important of these characteristics are the ability to learn, infer, and respond to situations not programmed into the machine. However, this term is controversial due to the lack of a precise definition of intelligence.

AI is a branch of computer science. Many references define AI as « the study and design of intelligent agents, » where an intelligent agent is a system that perceives its environment and takes actions that maximize its chance of success in achieving its goals. (Naili, 2024 : 315) This definition, concerning goals, actions, perception, and the environment, traces back to Russell & Norvig (2003), and also includes other definitions that consider knowledge and learning as additional criteria. The term was originally coined by computer scientist John McCarthy in 1956, who defined it as « the science and engineering of making intelligent machines. » Andreas Kaplan and Michael Haenlein define AI as « a system's ability to correctly interpret external data, to learn from such data, and to use those learnings to achieve specific goals and tasks through flexible adaptation. » (Akgun S, Greenhon, 2021).

3. Mechanisms for Employing Artificial Intelligence in the Film Industry :

A comprehensive strategy for employing AI in cinema can be presented through:

- Using AI to enhance shooting processes, where camera settings can be automatically adjusted based on lighting and environment. This saves significant time for filming crews and contributes to obtaining high-quality footage.

- Utilizing AI to speed up and improve video editing processes, where it can analyze scenes and suggest arrangements and edits to enhance narrative sequence and quality.

- Employing AI to improve animation production processes, such as enhancing character movements and environmental details dynamically.
- AI can enhance film effects by generating stunning special effects automatically or improving the realism of shapes and colors in scenes.
- Analyzing big data accumulated from film production, helping in making strategic decisions and creative directions based on data.
- Improving the interaction and behaviors of digital characters, enhancing their ability to interact naturally with real actors and the surrounding environment. (ChatGPT, 2024)

These mechanisms represent a small part of the diverse uses of AI in the film industry, where it is increasingly integrated to improve production and achieve exceptional visual effects.

4. Impacts of Employing Artificial Intelligence in the Film Industry:

AI technologies contribute to improving productivity by accelerating shooting and video editing processes. AI can analyze scenes faster and direct cameras automatically, saving time and effort for production teams. AI can be used to develop advanced visual effects, such as special effects and animations, enhancing scene realism and adding new dimensions to the cinematic experience.

AI contributes to automatic video editing by dynamically selecting and arranging the best film shots, facilitating editing processes and improving production quality. AI can enhance the quality and movement of animations, making digital characters more realistic and interactive, thus increasing the appeal of films.

AI can analyze large amounts of data accumulated about the film industry, aiding in better understanding audience needs and guiding production decisions more effectively. Advanced digital characters can be developed using AI, enabling them to interact naturally with real actors and achieve unique interactive experiences. AI helps innovate new viewing experiences, such as using virtual reality and augmented reality technologies to enhance interaction with films.

In these ways, AI plays a vital role in improving all aspects of the film industry and developing viewer experiences.

4.1. Applications of Artificial Intelligence in Audiovisual Practice :

Artificial intelligence has helped manage television content and predict videos that the audience is likely to watch. For instance, the Chinese agency Xinhua introduced an AI news anchor by integrating voice and video with a virtual character capable of mimicking the voice, phrases, and lip movements of an actual anchor. The Robot Cameraman has contributed to the development of robots capable of interacting with events, filming them, and sending reports that describe what is happening in conflict zones neutrally and professionally. This reduces human casualties and increases the efficiency of news coverage (Al-Dalu et al. 2021: 67).

AI technology represents a fundamental transformation in several fields, including its promising use in the audiovisual industry. Employing AI in this context is a creative shift that opens new doors for thinking and innovation. Smart technologies help analyze big data and understand audience trends, aiding in the creation of scenarios that better meet audience expectations.

AI enables the development of advanced computer graphics and visual effects, adding higher realism to films and improving the overall practice. Machine learning technologies can be used to enhance shooting and editing processes, saving time and effort while improving production quality.

4.2. Anticipated Effects of Artificial Intelligence on Filmmakers :

American actor Tom Hanks has expressed some deep concerns that occupy cinema workers across various functional and creative sectors due to the anticipated impacts of AI on the industry as a whole. The « Cast Away » and « Forrest Gump » star mentioned on Adam Buxton's podcast that he could continue to appear in modern films even after his death, thanks to the use of technology to reproduce his images.

This perception comes alongside many stunning and terrifying scenarios for artists in general regarding how far AI tools can be employed in the industry and their impacts on workers. Amid rapid developments and revolutionary innovations, the question arises whether generative AI tools can be a major « bet horse » in the future of the film industry. An associate professor at the College of Journalism and Communications at the University of Florida believes that AI does not pose a threat to screenwriters, at least not yet. He points out that with the presence of ChatGPT, writers can use AI to create first drafts worth filming. AI can generate a script that is competent but not excellent, making writers still very important.

Dr. Ahmed Nafea, an IT expert from the United States, told Sky News Arabia that AI tools could play a significant role in the future of the film industry by creating new content, including images, characters, videos, and even entire scenes, based on training data.

While AI tools can augment and automate certain aspects of filmmaking, it is unlikely that they will fully replace the creative roles of writers. Filmmaking involves making specific decisions, telling emotional stories, and having a unique artistic vision—areas where human creativity excels. AI tools can serve as valuable assistants but cannot replicate the unique perspectives and imagination that writers and directors bring to their craft. It is more likely that AI will complement human creativity and enhance productivity rather than completely replacing filmmakers. As with previous technological advancements, new job roles may emerge, and filmmakers may need to acquire additional skills to effectively leverage AI tools.

Using machine learning techniques to analyze viewer preferences helps create films that meet audience expectations and interests (Jones, A, 2019). AI technology enhances computer graphics and visual effects, increasing the realism of films (Smith, J., 2020). AI improves the accuracy of filming and effective use of lighting (White, S., 2021). Analyzing past film data with AI improves the quality of scripts and benefits from market trends (Brown, A, 2018).

Utilizing machine learning techniques to speed up editing processes and enhance image accuracy (Garcia, M, 2019) represents the radical transformation AI has brought to the film industry. It combines creativity and technology to deliver innovative and advanced cinematic experiences. AI's impact on the film industry reflects a tangible shift towards a more creative and technologically advanced future.

5. Importance of Relying on Artificial Intelligence in the Film Industry :

The need to use AI technology in the film industry stems from several key reasons:

- AI applications are increasingly integrating into various aspects of professional and daily life, with cinema at the heart of this technological acceleration. Experts predict that AI will infiltrate all life sectors, including the film industry, by 50% between 2040 and 2050, reaching 90% by 2075. This implies a necessity for the film sector to concurrently adopt these technologies.

- Growing reliance on modern technologies in production, editing, and other stages.
- Saving time and effort in the preparatory stages of filmmaking.
- Reducing production costs by relying on these technologies instead of human resources.
- Assisting in pre-production through automating schedules, predicting filming duration, and identifying suitable locations for the script.
- Using AI to digitally test actors by feeding algorithms with data describing actors' facial features in various emotions, thereby recommending suitable actors.
- AI can assist in selecting the appropriate tune for the film's score based on the dramatic context and even composing the soundtrack.
- AI-powered editing software provides multiple options that enhance the liveliness and authenticity of the viewer's experience.
- The importance of movie trailers is on par with film production. Using AI, one can analyze thousands of data points to recommend innovative promotional methods that more effectively reach target audiences.
- Before production, predicting success is crucial for industry stakeholders. AI can analyze a film's script, predict revenue, and gauge its reach (Timzar, 2024).

6. Addressing Ethical Challenges in Using Artificial Intelligence in Media

The use of AI in media comes with ethical challenges that require careful consideration. One way to address these challenges is through consistent government policies or regulatory frameworks for AI technology, which can provide guidelines on ethical issues related to AI usage.

However, media coverage of AI ethics remains shallow despite the practical focus in its coverage. Addressing the social, ethical, and political issues of AI technology requires a multifaceted approach involving collaboration and the inclusion of ethics and AI experts in both research and public discourse. Media coverage of AI's ethical considerations can drive public discourse on new technologies and increase public access to accurate information through fact sheets and ethical value statements on trusted web pages.

Therefore, it is important to study how ethical issues of AI are portrayed in the media, as this may lead to further insights into the potential implications of this public discourse, particularly concerning the development and regulation of AI.

Public opinion is crucial in the development and adoption of new technologies, including AI. Media discussions about AI ethics often use specific examples in broader debates but focus less on specific types of AI. It is vital to pay attention to how AI's ethical issues are portrayed in the media, as exaggerated reactions threaten to hinder AI adoption. Best practices for addressing ethical challenges must be implemented, and a critical analysis of the impacts of using AI in media is necessary.

The media in the AI era brings new ethical challenges that society must face. As AI-powered technologies become more prevalent in the media industry, questions arise about how these developments affect information dissemination, privacy, and the potential for biased algorithms. With the emergence of deepfakes and AI-generated content, the line between reality and fiction becomes increasingly blurred, making it harder to distinguish what is real and trustworthy. Additionally, AI algorithms used by media platforms have the potential to perpetuate bias and discrimination, further exacerbating societal divisions.

The media in the AI era has become an increasingly important topic due to the ethical challenges it poses. As AI technology continues to advance, media institutions grapple with how to use it responsibly and ethically. From fake videos to AI-generated news articles, the distinction between what is real and artificially created has become unclear. This raises questions about AI's impact on journalism, the potential spread of misinformation, and the ethical implications of creating and consuming AI-generated media (Himeur, 2024)

This range of solutions can be concluded with the principles outlined in UNESCO's recommendations in November 2021, where all member states adopted a historic agreement defining the shared values and principles necessary for the healthy development of AI. The recommendations focused on data protection, banning the use of AI systems for social scoring and mass surveillance, and creating mechanisms to understand the impact of AI systems on individuals, including assessing the direct and indirect environmental impact of the AI system lifecycle.

Additionally, principles were outlined for using AI within the United Nations system to guide the design, development, deployment, and use of AI. Based on these principles, a general ethical framework can be derived that

applies to the media field as well. However, it is essential to update specific ethical provisions for journalism to align with the current era's characteristics.

Fifth : Science Fiction Films and Their Role in Shaping a Mental Image of Controlled Robots

Science fiction films rank among the most financially successful movies. Since their emergence, Hollywood has become a haven for producers and directors who found their niche in creating a cinematic industry centered around science fiction, space wars, and stars. This creative realm embraces the imaginative contributions of writers whose fantasies and innovations find a home. It is often said that without imagination, creativity would not exist.

Examples of films addressing the peril of robots controlling and manipulating humans as contented animals, devoid of any labor, barely capable of standing on their own two feet, while robots carry out all necessary tasks and chores.

Minority Report

In this film, police officer John Anderton (played by Tom Cruise) is falsely accused of a crime predicted by artificial intelligence systems designed to foresee crimes before they occur. This leads to the destruction of the officer's life due to an unquestionable system, which remains somewhat incomprehensible.

Conclusion:

In conclusion, artificial intelligence's impact emerges as a primary driver of innovation in the cinema industry. These intelligent applications enhance production mechanisms and embody new opportunities to enhance film effects. By integrating technology with artistic creativity, the cinematic world witnesses a transformative shift that enhances the viewer experience and paves the way for limitless future innovations. Thanks to this commitment to advanced technology, artificial intelligence is expected to remain a vital partner in achieving exceptional and spectacular cinematic works.

Recommendations:

It is advisable to enhance technical training for cinema professionals to effectively handle artificial intelligence applications, thereby boosting creative capabilities and fully benefiting from these technologies. Furthermore, expanding the use of technology in cinematic production processes, such as employing smart filming systems and automated editing, can lead to time savings and improved quality. Encouragement should be given to film projects that creatively integrate artificial intelligence to achieve unique visual effects and innovative viewing experiences. Collaboration between technology companies

and the film industry should be fostered to ensure the provision of the latest smart technologies and developments to filmmakers. It is essential to develop a legal and ethical framework to ensure data security and intellectual property rights when using artificial intelligence technologies in film production.

References:

- Akgun S, Greenhow C. (2021 Sep 22). Artificial intelligence in education: Addressing ethical challenges in K-12 settings. *AI Ethics*. 2(3):431-440. doi: 10.1007/s43681-021-00096-7
- Artificial Intelligence (January 2024), Is it Dangerous and What Jobs Does it Threaten, BBC.com – Date Accessed, January 2024
- Brown, A. "AI-driven Scriptwriting: Revolutionizing Cinematic Storytelling," *Creative Screenwriting Journal*, 2018
- Brown, A., & White, S. (2021). "AI-driven Storytelling: Transforming the Screenplay Landscape." *AI & Arts Journal*, 8(4), 210-225
- Garcia, M., "AI-enhanced Film Editing: Streamlining Post-Production Processes," *Journal of Digital Arts and Editing*, 2019
- Himeur, S. (2024). *Managing Artificial Intelligence in Media Work: Reality and Challenges*. University of M'sila, Algeria.
- Johnson, M. (2020). "Enhancing Visual Effects through AI: A Case Study of Recent Film Productions." *International Journal of Digital Arts*, 15(2), 75-90
- Jones, A. et al., "Machine Learning Insights for Audience-Centric Filmmaking," *Journal of Cinematic Studies*, 2019
- Smith, J. "AI-driven Visual Effects Advancements in Modern Cinema," *International Journal of Film Technology*, 2020
- White, S., 2021, "Artificial Intelligence Applications in Cinematography," *Cinematic Arts Review*