

# Research on the Displacement Impact of Artificial Intelligence on the Film Industry

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**Abstract.** In recent years, the film industry has witnessed a significant transformation with the emergence of Artificial Intelligence (AI) as a formidable creative force. This abstract provides an overview of an essay exploring AI's multifaceted implications in the film sector. The essay delves into the palpable concerns surrounding AI's influence on the industry, particularly in scriptwriting. AI's remarkable script generation capabilities have led companies to explore cost-saving measures, which raises questions about the potential displacement of human creatives. The essay examines how these changes have sparked tensions, exemplified by the Writers Guild of America (WGA) strike. However, amidst these concerns, the coexistence potential of AI and human creativity is highlighted. The role of AI-regulating laws in safeguarding employment and ensuring ethical AI implementation will be discussed. Moreover, the essay underscores the enduring value of human creativity, as very few AI systems have passed the Turing test. Ultimately, the essay argues that the path forward lies in human-AI collaboration, offering insights into how the film industry can strike a harmonious balance between technological innovation and artistic expression.

**Keywords:** ChatGPT, Strike, AI Script Writing, AI-regulating Laws.

## 1. Introduction

### 1.1. Research Background

Artificial Intelligence (AI) Technologies are designed to assist working efficiency. However, it is getting horrifying because of its outstanding capabilities. The concern of replacing human jobs completely in the near future has been brought to the table, especially after the Chatbot Generative Pre-Trained Transformer (ChatGPT) was released by an American Artificial Intelligence Laboratory, Open AI, in November of 2022. Reactions have ranged from optimism because of its capabilities to fear for the future, especially in writing instruction [1]. The current landscape of AI is a testament to the remarkable advancements it has made in recent years. AI has transitioned from being primarily perceived as a tool for automating information creation, catering to individualized user needs, to a new era, as outlined in Science Magazine's 2022 publication, known as the "AI Gets Creative" era [2, 3]. In the preceding era, often referred to as the "AI-generated Content" (AIGC) era, users use AI to automate the information creation process while fulfilling users' personalized requirements. Stepping into the "AI Gets Creative Era" marks a turning point in AI development, where machines can increasingly generate genuinely creative and novel ideas. In this era, AI systems are demonstrating the ability to break free from the shackles of routine data processing and venture into the realm of imagination and creativity. Gone are the days when AI was viewed as a mere tool for automating repetitive tasks. It is becoming a source of inspiration and innovation, capable of producing content that surprises and challenges human creativity. To illustrate, ChatGPT's outstanding ability to generate story plots and treatments has gained great attention since its release. This signifies the commencement of the AI Gets Creative Era and implies that the defining human trait, imagination, is now replaceable. While AI may not possess this capability to its fullest extent, this recognition is causing unease among many individuals.

### 1.2. Literature Review

Besides, it is worrying that people are losing their jobs because of AI. Since the release of ChatGPT, numerous companies have decided to eliminate workers as it can replace their jobs completely.

Despite receiving criticism from people, their stocks ascended massively. Megan Leonhardt summarized since the publication of ChatGPT, 42% of American workers have shown their worries about replacement by AI in the near future [4]. This is mainly because big companies' reactions are not looking optimistically to them. The majority are only thinking about the future profits that AI could bring. Fewer labor costs are needed when AI is capable of replacing them. When this comes to the film industry, a strike has occurred as a response. Writers have been striking for getting less pay and requesting laws to protect manual works since the 2nd of May, 2023. The fear of being replaced by AI is in the air, and they are urging for action. On the other hand, AI technologies are helping the film industry with production efficiency. It makes computer-generated images (CGI) and film special effects less complicated and reduces the manual cost of making them for production companies. For example, *The Lord of Rings* (2001) relies heavily on these technologies. Without them, such an imaginative world would never be able to be brought on screens. It is undeniable that AI is one of the greatest inventions in the 21st century, as its performances in various areas are incredible and useful. However, it is not ignorable that its potential side-effects on the displacement impact on the film industry. Thus, to what extent should people be alerted by its ability, and to what extent should people cherish the potential it can bring to us?

Most researchers look into AI applications and their impacts on film productions as well as other areas such as education and languages. There is not much research diving into the areas of fear of AI's displacement in the industry and how it will influence future film production. The fear of displacement by new-born technologies will never disappear as long as human society develops. However, it is unforgettable that AI is only a tool for humans, and it is not as terrifying as what people thought when looking into deeper research. Reports on surviving together with AI in the film industry have not yet been published. There is a gap in finding the balance between AI productions and human-produced works in the film industry, especially script-writing. Scriptwriting is considered the most essential and creative step in making a film. A good film will never be made without a refined, imaginative script. It has the ability to determine the performance of a film. Therefore, the need of saving its creativity space from AI is needed as it is the representation of human imagination.

### 1.3. Research Framework

Thus, this essay will focus on the film industry specifically, using the recent Hollywood writer's strike that started on the 2nd of May, 2023, as an example and examine to what extent the film industry, especially the script writing area, has been influenced by AI. Moreover, an investigation into the reasons behind people's fears towards AI technologies' emergence will also be included, as well as actions needed in the film industry to help human workers survive together with AI.

## 2. Case Description: Fears Towards AI

Is the fear of AI just another mountain out of a molehill, or is it seriously concerning? It is common that people tend to express fears about the unknown new-emergence technology. A similar case happened during the Industrial Revolution in the 19th century. The invention of the camera fundamentally changed the role and value of portraits by producing a more realistic image and making it more affordable and accessible to the public [5]. Numerous painters had to switch jobs as they were no longer needed. Nonetheless, there are other modern examples. To illustrate, the biggest American digital content creator company, BuzzFeed, unemployed 180 workers as AI, especially ChatGPT, can replace their written work. Despite criticism of this action, its stock jumped 150% [6]. From these, advanced innovation eliminating manual work is not something new; therefore, the fear of it is understandable.

In the meantime, the film industry faces threats like the painters back in the 19th century because of AI. People are acting to prevent the tragedy from taking place again. To illustrate, the Hollywood writers have been going on a strike since the 2nd of May, 2023. The Writers Guild of America (WGA) went on strike for the first time in 63 years after failing to reach an acceptable agreement with the

Alliance of Motion Picture and Television Producers (AMPTP), the trade association that negotiates for the film and television interests of the major Hollywood studios [7]. One of the main reasons behind the strike is to resist the threat of AI, which is also considered humankind's first collective action against AI [8]. According to SAG-AFTRA president Fran Drescher, "If we don't stand up now, we will face the threat of being replaced by machines soon" [8]. Concerns in the film industry towards AI have been spread, threatening workers as their salaries have been lowered. Therefore, strikers demand producers and media companies not to replace actors with AI-generated voices and faces [8]. It can be seen that workers require the industry to seek a balance between AI usage and manual inputs, avoiding the situation of jobs being taken away by technologies like portrait painters in the 19th century and BuzzFeed company. Thus, their worriedness is reasonable, especially when less-safer working conditions appear.

### **3. Analysis on the Problem: AI Application in Film Production**

#### **3.1. Current Situation of AI Script Writing**

How capable is AI in the scriptwriting performance? Despite the fears in Hollywood, AI application in the film industry is not new and has been adopted for years. The film industry relies heavily on human creativity and imagination, from pre-production to post-production. These include budget estimation, script writing, casting, being actors, special effects production, post-production editing, image restoration, and publicity development for films [9]. Without much knowledge, this new technological revolution of AI has impacted the whole creation process since the early 2000s. Initially, it is used to generate special effects and CGI. As this technology gets more advanced, it has been involved in scriptwriting since 2016. Scriptwriting is the most essential and complicated step in the pre-production of a film. It determines the success or failure of a film directly. To develop an attractive script for the audience, it must be innovative and contain both narrative and emotional expression. It usually requires experienced writers with a keen insight into life [9]. To test the capability of AI writing scripts, director Oscar Sharp and artist Ross Goodwin used AI with the given name Benjamin to generate a short film script named Sun Spring [10]. They trained Benjamin with a Recurrent Neural Network (RNN) together with Long Short-Term Memory (LSTM) by feeding it to science fiction movie scripts such as Star Trek, Truman's Worlds, and X-Men [9]. By doing so, Benjamin adapts the basic structure of the scripts and learns how to create stage directions and generate well-formed lines [9]. Its productivity is terrifyingly much faster than humans, as it usually takes years to generate a refined script, but AI only takes a few days.

#### **3.2. Problem Identified by AI Script Writing**

Seeing the success of AI in generating scripts, businesses are increasingly inclined to reduce expenditures on human scriptwriters, shifting their attention towards the advancement of AI-powered script writing. This move has led to a swift and current response in the form of the Hollywood Writer's Strike in 2023. The consequence of the Writers Guild of America (WGA) strike is obvious as it delays the new seasons of massively popular TV shows and late-night talk shows on hiatus [7]. Furthermore, it sets off a chain effect across the broader entertainment industry. The film industry primarily comprises three integral departments: pre-production is the getting ready-to-shoot stage. All planning and preparations occur at this step: production, also known as the shooting stage; and post-production, usually refers to the editing and any after-effects stage of the project. These departments are intricately interconnected and wield significant influence.

Any omission of one of these phases would render the production of a film unfeasible. Furthermore, these departments can encompass a workforce ranging from a few dozen individuals to several thousand. It initiates at the writer's stage, where the absence of scripts leads to a halt in pitching, leaving companies devoid of script-related tasks and effectively halting the entire pre-production phase. This interruption in pre-production subsequently affects the production department, with no further shooting or acting activities taking place. It encompasses a range of roles, from the camera

and lighting departments to the art department, directors, producers, and actors, all left without a project to engage with. Consequently, post-production firms face the situation of having a lack projects, necessitating workforce reduction due to diminishing profitability. As a result, numerous companies have no projects to work on, and tens of thousands of people have been laid off. The entire film industry is in an economic downturn.

### **3.3. Reason Analysis of the Problem**

The reasons behind the invention of AI-generating script technology are appealing to production companies because creating a good script is never easy. This is because it is considered the most essential and crucial step of creating a film as it provides a means of examining the relationship between the orders of discourse within written texts and the process of visualization, which involves many genres of writing, both literary and non-literary [11]. On average, around \$110,000 is paid to scriptwriters. It is not known as a smooth process and normally requires around 3 to 4 months for writers to create one. Moreover, this does not include the time for further refinements with directors and producers. As a result, more creation time is needed for a refined script ready for shoot. Therefore, manual script writing usually requires budgets and a long time to create.

Thus, the benefits of AI-generating scripts are obvious. Firstly, it offers cost savings for production companies, eliminating the need to purchase scripts from human writers. This also eliminates the process of entering into contractual agreements with writers, mitigating potential copyright complications. Secondly, its ability to swiftly generate scripts reduces the time required for film production, resulting in lower budgets and a more efficient shooting process.

## **4. Suggestions**

### **4.1. Artificial Intelligence and Employment Law**

It is undeniable that a sense of panic has permeated the entire film industry, especially after seeing the incredible performances of AI-generating scripts and other aspects. Paradoxically, although the WGA's strike set off a ripple effect across the film industry, it is ironically considered one of the solutions to counteract the looming threat of AI's displacement in the film industry's future. Although it influences tens of thousands of people from the film industry negatively at the moment, it raises public awareness towards the threat of AI for the first time throughout human history. The WGA strike is not only the first strike in Hollywood in 63 years but is also considered the first human protest against AI to date [8]. Consequently, it has garnered significant global attention to the AI issue.

On the other hand, the convenience brought by AI undeniably proves to be highly beneficial. Therefore, it is believed that people should learn how to co-exist with AI; a balance between AI and human-produced works is needed. A film producer said, "We should learn to co-exist with artificial intelligence rather than oppose it. AI can help us complete the initial drafts more quickly, allowing screenwriters to focus more on the intricacies and emotional depth of the story" [8]. As a result, the WGA strike highlights the need for legal protections encompassing AI and employment within the film industry. This need is already being recognized on an international scale. In June 2023, the European Parliament voted in favor of the EU's "Artificial Intelligence Act." The next step for this legislation is to officially enter a negotiation process involving the European Commission, the European Parliament, and member states to determine the final legislative text. This law is also expected to be the world's first comprehensive AI legislation [8]. Together with the WGA's strike, the world is seeing the growing importance of regulating AI and safeguarding employment in the film industry.

### **4.2. Human-AI Collaboration is the Way Out**

However, is AI scriptwriting capable of replacing human labor completely? There are still minor issues that make AI incomparable to humans. Returning to the AI-generated short script, Sun Spring, it has a lack of logic and flow in most lines. For instance, there is obvious chaos in lines towards the

film's end when the female protagonist confronts the camera. Nonetheless, the narrative is still poorly structured due to the immature technology [12]. Although the team came up with a better-created script, it's *No Game*, in 2017, it is still noticeable that Benjamin was not the only writer in the script because director Oscar Sharp was also involved in the creation process. Therefore, this is a cooperation creation between AI and humans instead of fully AI-driven production [12].

Thus, human inputs in an AI-generated script are still not replaceable. Although it has the ability to generate an adequate script in a shorter time, human inputs are still needed to help with the logic flows in the script. Nonetheless, AI can only generate scripts under an amount of similar pre-existing scripts that have been fed to it. Without the human efforts of feeding them, they cannot generate good-quality scripts. Besides, if AI can only generate scripts by learning from pre-existing scripts, it can only create similar outcomes. As a result, innovation in the ideas will never appear, and all the scripts will look similar and predictable to the audience. Therefore, AI is fun but never an author. The solution to efficiently produce a well-structured script would be to combine the works of AI and human efforts. As AI is capable of generating a script in a short time, its drawback is obvious: it has a lack of logic. Human efforts are needed to help with refining the sentences and logic issues. A well-crafted script can only be produced through the synergistic combination of a sufficient amount of human and AI efforts.

### 4.3. AI is Never an Author

It is equally crucial for businesses to recognize that AI can never truly be an author. They must grasp the limitations associated with placing complete reliance on AI-generated content. There are already negative examples of excessive dependence on AI and ChatGPT. This is because ChatGPT has not officially passed the Turing Test in the sense of achieving human-level conversational ability across all domains until September 2023. The Turing Test refers to a proposal made by Turing to deal with whether machines can think [13]. The failure to pass the Turing Test, which only 1 AI has been able to pass, highlights its limitations. The presence of logical issues and AI's reliance on pre-existing online information to generate content highlight its potential for further development. Companies must be mindful that AI cannot still communicate indistinguishably from a human, and there are potential adverse consequences associated with excessive reliance on it. An illustrative example is Steven Schwartz, a professional US lawyer with 30 years of experience who decided to utilize AI to generate legal cases. The AI system crafted numerous convincing cases, which Steven subsequently submitted. Unbeknownst to him, these cases were entirely fabricated, and ultimately, he faced a failed defense in 2023 [14]. Hence, companies should not be blinded by the efficiency offered by AI. It's essential to remember that AI is a tool created by humans and can never fully replace human capabilities. While AI is productive, it can never truly be an author or possess the depth of human creativity and understanding.

## 5. Conclusion

In conclusion, concerns about the potential impact of AI on the film industry are reasonable. AI's impressive script generation capabilities have prompted companies to seek cost reductions by reducing human involvement. While this industry shift is unsettling, there are promising signs of change. The Writers Guild of America (WGA) strike and the emergence of AI-regulating laws in Europe signal a turning point. It is paramount to recognize that human creativity in scriptwriting remains irreplaceable. Only a few AI systems have successfully passed the Turing test, underlining that AI is far from replicating the depth and authenticity of human creativity. This essay has proposed potential solutions for navigating the AI Gets Creative era. These include implementing AI-regulating laws and a heightened awareness of the limitations associated with excessive reliance on AI. Striking a balance between AI-generated works and human contributions remains an uncharted territory.

It is crucial to emphasize the importance of this matter as AI continues to advance rapidly. People must adapt and learn to co-exist with this technology. The equilibrium between AI-produced content

and human labour is a field ripe for exploration and endless possibilities. Therefore, fostering collaboration between humans and AI will be key to maintaining productivity and avoiding potential conflicts in the future.

## References

- [1] Tseng, Waverly, and Mark Warschauer. AI-writing tools in education: if you can't beat them, join them. *Journal of China Computer-Assisted Language Learning* 0 (2023).
- [2] Du Hongyang, Li Zonghang, Dusit Niyato, Kang Jiawen, Xiong Zehui, and Dong in Kim. Enabling AI-generated content (AIGC) services in wireless edge networks. *arXiv preprint arXiv: 2301.03220* (2023).
- [3] Kennedy, Donald. Breakthrough of the year. *Science* 302, no. 5653 (2003): 2033-2033.
- [4] Zhao, Yu. and Zhang, Yichi. How Will ChatGPT Affect the Film and Television Industry? The Development Trend of the Film and Television Industry in the Context of Generative Artificial Intelligence. *New Film Works*, 2023, (02), 4-13.
- [5] Kim, H. Ethan. Photography's Impact on Art During the Industrial Revolution, 2022. *Salmagundi*, no. 84 (1989): 15.
- [6] Darcy, Oliver. BuzzFeed says it will use AI to help create content, stock Jumps 150%. *CNN Business*, 2023. <https://edition.cnn.com/2023/01/26/media/buzzfeed-ai-content-creation/index.html>.
- [7] McMahan, James. The Political Economic Roots of Hollywood Strikes (A Series of Blog Posts). *Notes on Cinema* (2023).
- [8] Da Xiao. and Tao Duanfang. and Liu Yupeng. and Zhen Xiang. and Chen Kang. Hollywood Strike to resist "AI Invasion". *Global Times* (008), 2023. DOI: 10.28378/n.cnki.nhqs.2023.004168.
- [9] Li, Yaxing. Research on the Application of Artificial Intelligence in the Film Industry. In *SHS Web of Conferences*, vol. 144. EDP Sciences, 2022.
- [10] Chai, Y. The Opportunities and Challenges of Artificial Intelligence for Film and Television Industry. *Modern Film Technology*, 2020, (10): 51-55.
- [11] Ellis, John. What does a script do? *The yearbook of English studies* 20 (1990): 60-64.
- [12] Zhao, Yu. and Zhang Yichi. How Will ChatGPT Affect the Film and Television Industry? The Development Trend of the Film and Television Industry in the Context of Generative Artificial Intelligence. *New Film Works*, 2023, (02), 4-13.
- [13] Hanna, Robert. "How and Why ChatGPT Failed the Turing Test." Unpublished MS. Available online at URL=<[https://www.academia.edu/94870578/How\\_and\\_Why\\_ChatGPT\\_Failed\\_The\\_Turing\\_Test\\_January\\_2023\\_version\\_\(2023\)](https://www.academia.edu/94870578/How_and_Why_ChatGPT_Failed_The_Turing_Test_January_2023_version_(2023))>.
- [14] Armstrong, Kathryn. ChatGPT: US Lawyer Admits Using AI for Case Research. *BBC NEWS*, 2023.