Employing artificial intelligence techniques to make films

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A R T I C L E   I N F O

A B S T R A C T

The film business is one of the many industries that artificial intelligence is inexorably involved in due to the rapid advancement of technology. Artificial intelligence benefits the industry at every stage of the production cycle. This paper focuses on five phases: script writing in AI, picture generation in AI, voice recordings in AI, make animation in AI, movie editing, with a presentation of artificial intelligence tools.

This research highlights that artificial intelligence (AI) technology and human artistic production are essential for the robust growth of the film business only when they complement one another by examining the advantages and possible hazards. The research encourages the new trend towards employing artificial intelligence to produce short films for graduate and undergraduate students, researchers, and those interested, and to benefit from the free features available on artificial intelligence websites that do not require expensive purchases to obtain benefits.

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1.Introduction

There are several subfields within modern computer science, and one of the newest technologies, artificial intelligence, is receiving more and more attention from all directions. Artificial intelligence is a technical science that simulates, develops, and investigates human intelligence. It has been applied widely and produced successful outcomes in many fields. Since its inception, movies have combined art, culture, entertainment, and cutting-edge technologies. This fusion of the two has been inevitable because of movies' high public exposure, their significant market influence, and the demand for cutting-edge technologies. As a result, there is a great deal of room for practical AI applications in the film and television industries. As of right now, artificial intelligence (AI) may assist with pre-production budget estimation, script writing, casting, acting, producing special effects, post-production editing, picture restoration, and film publicity development. However, AI is not yet able to handle more complicated duties like directing.

The article studies the application of artificial intelligence (AI) in the industry of film, with a particular emphasis on the effects of this recent technological innovation. This study is structured into five sections that cover the following topics: how AI is used in script writing; how AI picture generation works; how AI voice recordings work; how AI makes animation; and how AI edits movies. This study presents the probable future of artificial intelligence in the film industries and focuses on both the positive and negative effects of the technology. It also provides some references for future research on artificial intelligence in the film industry. Artificial intelligence techniques have produced a revolution in the processes of film
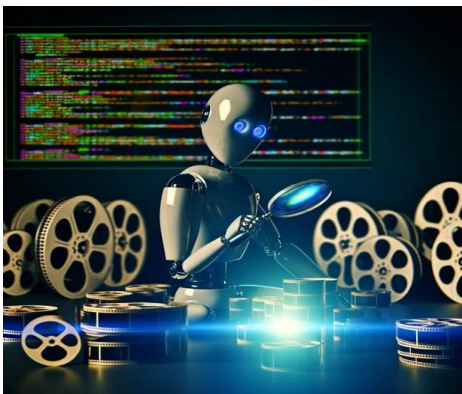

Figure 1: Image form Chatgpt-4

production and editing in modern forms, instead of film making imposed by expensive devices and equipment. The trend towards websites with artificial intelligence applications and the flexibility and high quality they provide has contributed to increasing the aesthetic of photo, sound, photo animation, and film making instead of the dominance of traditional software companies that impose financial restrictions by moving towards the advantages provided by artificial intelligence, which has recently become one of the most important tools used by digital video content makers and short film makers on the Internet (Nantheera Anantrasirichai1 ,David Bull1, 2021).

problem statement

In the rapidly evolving landscape of the film industry, the integration of Artificial Intelligence (AI) technologies has become a pivotal element across various stages of film production. Despite the promising advantages offered by AI in enhancing creativity and efficiency, there remains a critical gap in understanding the optimal synergy between AI tools and human creativity. This research aims to dissect the nuanced roles of AI in the film production process, specifically focusing on script writing, picture generation, voice recordings, animation, and movie editing. It seeks to evaluate the balance between leveraging AI for technical advancements and preserving the intrinsic human artistic essence vital for the film's authenticity and emotional depth. The study will also explore the accessibility and practicality of AI tools for amateur filmmakers, particularly students, and researchers,

highlighting the importance of free or affordable AI resources in democratizing film production. This investigation is crucial for identifying pathways to harmonize AI with human creativity, ensuring the sustainable growth of the film industry in an era of technological ubiquity.

Research objective: The research aims to identify applications of artificial intelligence in filmmaking.

2. AI And FILM INDUSTRY

2.1 Script Writing

Human screenwriters are completely incapable of matching the creative speed of artificial intelligence screenwriters. AI can develop a script in a few days instead of months or even years, which can expedite the production process even for horrible scripts. AI can also generate fresh concepts that authors might not have considered thanks to its enormous database. However, there are still certain unavoidable shortcomings in AI scriptwriting, like illogical and unclear language and ridiculous stories that lack the substance to withstand close examination. AI does not yet have the sophisticated and realistic emotions, decades of writing experience, original and flexible thinking outside the box, or traditional cultural spirit that human screenwriters do. This explains why there is still a significant difference between scripts created by AI and those that have been polished over time by humans. Currently, though, AI can be used by human screenwriters to inspire and expand their perspectives while also enhancing the cell state (Li, 2022).

Fortunately, AI can. Massive volumes of data are provided to machine learning algorithms in the form of book or movie scripts that need to be altered. These algorithms then assess, learn from, and produce novel scripts. The process's significant acceleration allows filmmakers to save a great deal of money and time.

Filmmaker Oscar Sharp has taught a machine, named Benjamin, how to write a script and dialogue for a movie in partnership with Ross Goodwin, an AI researcher at NYU. Benjamin is a Long Short Term Memory (LSTM) recurrent neural network that was "fed" numerous scripts. Through training, this AI has learned to predict letters that typically appear next to one another as well as sentences and phrases that are frequently used together. Benjamin wrote a screenplay for the 9-minute short film "Sunspring," which was made for the yearly Sci-Fi London film festival and made its premiere on Ars Technica, using only the director's opening sentence as guidance. Additionally, Benjamin wrote a song whose lyrics were featured in the short film (C.Macdonald, 2016).

2.2 Picture generation

To achieve the finest results, a director must previsualize their film. A storyboard is a type of graphical organizer that consists of sequentially arranged pictures and visuals. It can be necessary to film each scenario from several perspectives and shots. The creators can better imagine the scene by storyboarding the script. An artificial intelligence system designed for cinema storyboarding estimates the number of shots from a script and then classifies the various shot elements using a text-to-image classifier. After that, it looks through the archive database for pictures that best fit the shot's specifications, creating a storyboard in the process. can create their own storyboard or follow the system's recommendations. The developers assembled a training set of sequences and related frames from a number of films in order to get this AI system to function. After being trained on human-annotated data, computer vision analyzes every frame of the film to produce a shot description for every frame. To provide the system with training data, individual production houses are able to supply their own archive video (D.Ray, 2017).

2.3 Voice Recordings

Movie soundtracks and background scores have a big impact. In this sector of the film industry, artificial intelligence systems have huge opportunities for development. It is possible to create machines that can evaluate a collection of songs as input and then create entirely new music.

One important and time-consuming part of film post-production is dubbing. AI systems that can clone any person's voice simply listening to a few minutes of that person's sample voice could be created. This could be important in the film industry when actors can just provide voice samples instead of dubbing for their roles. The post-production phase will benefit greatly from these time savings (Reddy, 2019)**.**

2.4 Animation

Making animation in AI" often refers to the process of creating animated content using artificial intelligence software or tools. This process can incorporate numerous AI approaches and technologies, and here are some major elements linked to it:

- **Automated Animation**: AI is capable of automating some animation processes, such in-betweening, which is the act of creating transitional frames between two images to make them appear to be moving.
- **Machine Learning**: AI can develop new animations based on patterns and styles it has learnt from current ones, saving time and effort compared to creating animations from start.
- **Natural Language Processing (NLP):** AI is able to comprehend text descriptions and graphically express the actions by turning them into animated sequences.
- **Motion capture and facial recognition:** Artificial intelligence (AI) has the ability to interpret the facial expressions and movements of human actors into animated characters, which simplifies the motion capture procedure.
- **Procedural Animation**: AI systems are capable of producing intricate animations by procedural means, including lifelike movements of smoke, fire, water, and people.
- **Style Transfer:** Artists can experiment with multiple styles without having to hand recreate the animation by using AI to transfer the artistic style of one animation to another.
- **Personalization:** AI has the ability to dynamically change characters, settings, and storylines in animations in response to viewer input.

AI-powered predictive animation can forecast the subsequent frames in an animation sequence, resulting in motion that is more realistic and fluid.

The topic of using AI to create animation is developing, with the potential to transform conventional animation techniques by boosting productivity, cutting expenses, and creating new possibilities for creativity (Momot, 2022).

2.5 Movie Editing

The term "Movie Editing" refers to the process of assembling, cutting, and manipulating film or video footage to create a finished work that tells a story or presents information. Here's a more detailed breakdown:

- **Selection**: The editor goes through all the footage (also known as rushes or dailies) and selects the best takes according to the director's vision.
- **Sequencing**: The selected footage is arranged in a sequence to ensure the story unfolds in a logical and emotionally engaging manner.
- **Pacing and Timing**: The editor determines the rhythm of the movie by varying the duration of shots. This affects the tension, atmosphere, and progression of the narrative.
- **Transitions**: The editor uses various types of transitions (like cuts, fades, wipes, and dissolves) between shots to aid storytelling and maintain continuity.

- **Continuity**: Ensuring that the visual, spatial, and temporal aspects of the story are consistent throughout the movie.
- **Sound Editing:** This involves adding, editing, and synchronizing audio elements like dialogue, background music, sound effects, and ambient sound.
- **Visual Effects (VFX)**: Incorporating and editing special visual effects to enhance or create environments, objects, or characters that are not present in the live-action footage.
- **Color Correction and Grading**: Adjusting the color and lighting of shots to achieve a visual tone or mood and ensure consistency across shots.
- **Titles and Graphics**: Adding opening and closing titles, subtitles, and any on-screen text or graphics required for the film.

Movie editing is a critical part of the post-production process and can significantly impact the final product's quality and storytelling effectiveness. To shape the story, one must have both technical proficiency with editing tools and artistic judgment. (Ghosh, 2023).

 CapCut is A commonly used video editing program with many features for making, editing, and improving films. Among its notable characteristics are:

- **Video Editing:** Complete tools for dividing, chopping, and combining video clips so you can tell your narrative.
- **Text and Stickers**: a selection of text styles and stickers that you may use to add fun and emotion to your films.
- **Filters and Effects**: A huge variety of filters and additional effects to improve your films' visual attractiveness.
- **Music and Sound Effects:** The option to import your own sound effects and music files or use a library of pre-existing ones to incorporate into your videos.
- **Animation**: Techniques like key frames allow you to give your video parts a fluid, flowing motion..
- **High-Quality Export**: the capacity to export videos in high definition for posting on YouTube, Instagram, TikTok, and other social networking sites.
- **Overlay and Blend Modes** Tools to apply mix modes and layer pictures or movies to create artistic effects.
- **Speed Control**: Options to change how quickly your video clips contribute to create slow-motion or fast-forward effects.
- **Advanced Audio Editing**: Features to fine-tune sound using mixer settings, add voiceovers, and modify audio levels.
- **Chroma Key (Green Screen):** enables you to use the environmentally friendly screen effect to alter the background of your movies.
- **Templates**: a selection of presets and templates for simple and quick video making that may be used for different events and themes.
- **Easy-to-Use Interface:** Because of its user-friendly design, both novice and seasoned users may utilize it.
- **AI Features:** To make editing easier, certain CapCut versions come with AI-driven capabilities like scene recognition and auto-captioning.
- **Aspect Ratio and Background**: Tools to modify your video's aspect ratio for various platforms and add or remove graphics or colors from the backdrop.

CapCut Its software is updated often to include novel capabilities and enhance the user experience; hence, the tools and functions that are offered may increase with time. Its vast feature set and simplicity of use make it popular for producing material for social networking, vlogging, and personal video projects. (AL-Bahnam, 2023).

2.6 A.I. TOOLS

Tools for artificial intelligence (AI) are software programmes, frameworks, or applications that leverage AI to do tasks that would typically need human intellect. Because these tools can learn from data and improve over time, they are becoming increasingly skilled at handling complex procedures. Tools for artificial intelligence (AI) serve a variety of purposes, including but not limited to:

- **Runway**: is well-known for its text-to-video capabilities, provides a variety of AI tools for creating and manipulating images and videos. For content providers searching for high-quality video creation, it's very appropriate.
- **Pika Labs:** Pika Labs is a more recent tool that runs on Discord and offers highly customisable text- or image-based movie creation. Currently, it's free while it's in beta.
- **FlexClip**: This easy-to-use software is excellent for fast producing films with a polished appearance. It is perfect for social media or instructional videos because it comes with a wide range of templates and AI-powered editing features.
- **Synthesia**: Synthesia is unique in that it can produce talking-head films that are lifelike. This makes it ideal for explainer videos, product demonstrations, or customised video messaging. It provides a selection of AI-powered voices.
- **DeepBrain AI:** It may be used to create interesting instructional or training movies without any prior video editing skills, and it has photo-realistic AI avatars.
- **Lumen5:** A platform driven by AI that turns text into movies, ideal for turning articles or blog entries into interesting content. It has a small selection of templates but offers editing options and brand customization.
- **InVideo:** a flexible platform with several customisation choices and an AI script generator. Its user-friendly interface makes it very useful for making captivating YouTube videos.
- **Colossyan:** s useful for creating educational clips and basic lesson films since it is recognised for employing actual actors to produce AI videos that appear more realistic.
- **HeyGen:** An intuitive text-to-video tool that tracks video performance with statistics, making it ideal for producing social media content that can be shared.
- **gravitywrite** is a writing platform driven by AI that offers more than 80 tools to assist with different content production needs. Users may increase productivity and creativity by producing engaging and human-like content more rapidly with the aid of this platform. It makes producing multilingual content in more than 80 languages easier.
- **leonardo:** is a versatile platform designed to create digital art and game content by utilizing the power of artificial intelligence and machine learning. It's specifically made to enable the creation of a wide range of visual components, such as concept art, objects, and textures, by artists and game developers.
- **elevenlabs:** is a speech AI research and implementation firm that seeks to enable universal access to material in any voice and language. Their goal is to develop the most realistic, adaptable, and contextually aware AI audio possible, with the ability to produce speech in 29 different languages and a wide range of sounds.

3.Implentation

Figure 2 shows the implantation film industry. The five sections are depicted in the figure 2. The implantation film industry structure consists of the five stages: script writing, picture generation, make animation, voice recording and movie editing, all these stages depend on artificial intelligence tools. Each stage of the implantation film industry is described in details in figure 2.
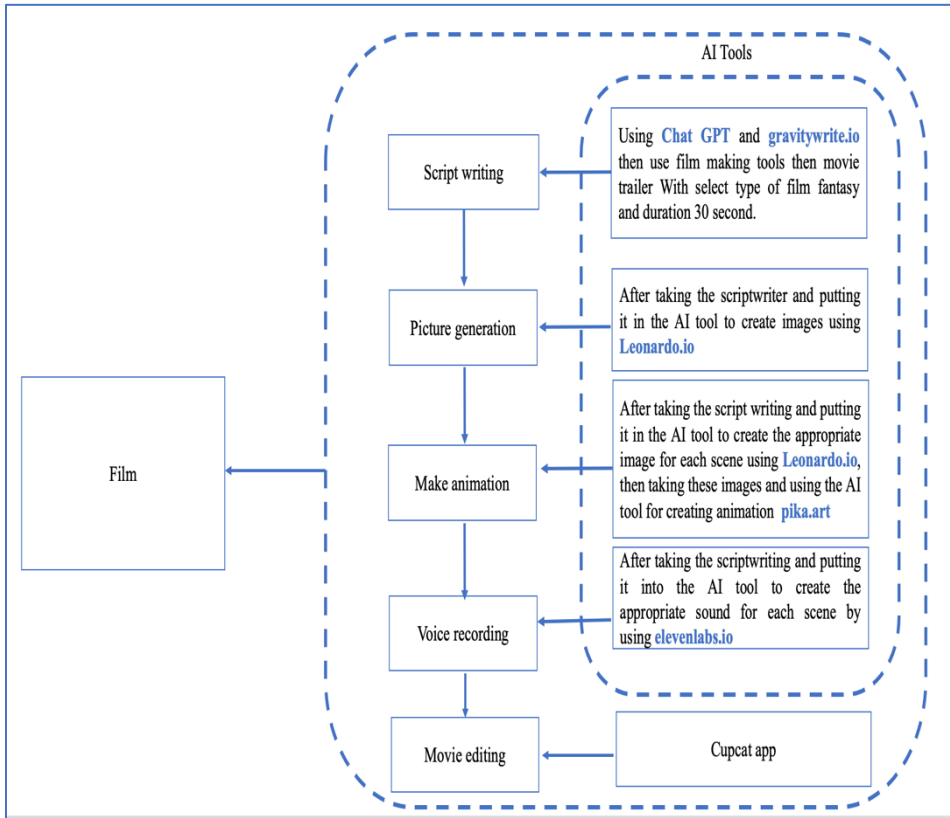
Figure 2: The Block Diagram of Implantation Film Industry.

4.Result

It will present the results and techniques that were applied in this study.

- **Poster for the film**

    Using chat GPT-4 the movie poster was designed.

Figure 3: Poster for the film

- **script writer**

In this research, the ChatGPT was used to create the scriptwriting for the film, and then it was converted into scenes using the AI tool gravitywrite.io. The story is fictional, was chosen in Arabic, and its name is "The Young Man and the Star".

Figure 4: Script writer from ChatGPT

Figure 5: Scenes of a script writer from ChatGPT

- **Image generation**

Following the scriptwriter's input into Leonardo.io's AI image making tool, the following images generated:

Figure 5 : Image Genaration from Leonardo.io's

Make animation

Following the script writing process, the AI tool uses Leonardo.io to generate an appropriate picture for each scenario. These images are then used in the AI tool to make the animation, which is called pika.art.

- **Voice recoding**

  After using elevenlabs.io to take the scriptwriting and input it into the AI tool, each scene will have the proper sound created.

- **Movie editing**

Finally, CapCut was used to generate a native video.The movie lasts range from 1 minute to 2 minutes. In Figure 6 below is a screenshot of the movie.

Figure 6 : Film "The Young Man and the Star"

5. Conclusion and Recommendations

The film and television industries have benefited from the integration of intelligence. Artificial Intelligence has the potential to significantly impact every aspect of film production, including special effects shots and film production cycle reduction. In order to produce better works for the film business, artificial intelligence (AI) technology must be applied in a way that enhances technology and art, which is an inevitable combination in today's world. More subliminally generated creative content, more realistic and complex emotions, and specific artistic accomplishments are still required for the evolution of films, even with the technological backing and expanded ways of thinking that artificial intelligence offers. The film industry will succeed when both of these factors work together. A few references for AI research in the film business are provided in this paper.

The research recommends employing artificial intelligence for making short films for academics, graduate and undergraduate students, and anybody else who is interested.

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توظيف تقنيات الذكاء الاصطناعي لصناعة الافلام

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الخلاصة:

تعتبر صناعة الأفلام واحدة من العديد من الصناعات التي لا مفر منها في استخدام الذكاء الاصطناعي فيها بسبب التقدم السريع في التكنولوجيا. يفيد الذكاء الاصطناعي الصناعة في كل مرحلة من مراحل دورة الإنتاج. يركز هذا البحث على خمس مراحل: كتابة السيناريو في الذكاء الاصطناعي، توليد الصور في الذكاء الاصطناعي، تسجيلات الصوت في الذكاء الاصطناعي، صنع الرسوم المتحركة في الذكاء الاصطناعي، تحرير الأفلام، مع عرض أدوات الذكاء الاصطناعي.

يسلط هذا البحث الضوء على أن تكنولوجيا الذكاء الاصطناعي (AI) والإنتاج الفني البشري أساسيان للنمو القوي لصناعة الأفلام فقط عندما يكمل كل منهما الآخر من خلال فحص المزايا والمخاطر المحتملة. يشجع البحث على التوجه الجديد نحو استخدام الذكاء الاصطناعي في إنتاج الأفلام القصيرة لطلاب الدراسات العليا والجامعية والباحثين والمهتمين، والاستفادة من الميزات المجانية المتاحة على مواقع الذكاء الاصطناعي التي لا تتطلب شراءات مكلفة للحصول على الفوائد.