

244. ARTIFICIAL INTELLIGENCE IN THE SPHERE OF VIDEO PRODUCTION

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The use of artificial intelligence in video production is described in this paper. It provides an overview of the use of artificial intelligence at various stages of video production, as well as the economic implications of its implementation.

Artificial intelligence (AI) is a specialty within computer science that is concerned with creating systems to replicate human intelligence and problem-solving abilities. They achieve this by ingesting vast amounts of data, processing it, and learning from past experiences to optimize and enhance future performance [1].

At the start of this decade, significant progress was made in the development of generative AI, which enables the creation of articles, poems, images, videos and music. This was achieved through the development of new AI models, such as OpenAI's GPT-1 and DALL-E neural networks and others [2]. Neural network is a machine learning model that stacks simple "neurons" in layers and learns pattern-recognizing weights and biases from data to map inputs to outputs [3].

These breakthroughs have been made possible by more advanced machine learning models. Machine learning models are methods of training computers to identify patterns and generate predictions or content [4]. Models such as transformers, generative adversarial networks, diffusion models are used to generate realistic images, videos, text and music. The creation and development of these models have led to substantial changes in the process of video content production and even in the economic landscape of the sector.

Modern video production involves a number of stages: script preparation, filming, editing, image processing, adding effects, and distributing the finished material. AI can be applied at virtually every one of these stages.

AI helps screenwriters with their work. Neural networks can be used in the creative process to generate ideas and create storyboards, helping screenwriters to visualise their story and introduce new and unexpected perspectives. For example, the ChatGPT AI model is well suited to these tasks. Furthermore, there are neural networks designed specifically for screenwriters. For example, there is Nolan, which allows to enter only the title, the plot and a couple of keywords describing the genre, after which it generates the opening of a draft text. Plotdot works on a similar principle, but offers greater control. Major studios are developing their own neural networks for scriptwriting.

But one of the issues which arises while using neural networks in screenwriting is intellectual property. Large language models (LLMs) like ChatGPT demand vast datasets for effective training. Hollywood's studios wished to train LLMs using extensive screenwriting archives from films and television series. This was one of the reasons behind the strike by Hollywood screenwriters and actors in April 2023. The writers contended that employing their work without fair compensation or permission violated their intellectual property rights and diminished the value of their creative labor [5].

However, the development of AI has had a particularly significant impact on video production. Neural networks have made it easier to create certain scenes in films, contributed to the emergence of new types of online videos, and reduced costs and production times. They automate routine tasks and reduce reliance on expensive equipment. For example, neural networks can be used to generate subtitles for videos. This has been particularly helpful in the production of vertical and short-form videos. It is very common to come across videos with subtitles on social media. Neural networks such as GPTunnel, Invideo and ruGPT assist in generating subtitles.

Furthermore, neural networks that can enhance the quality of videos by taking a blurry image and producing a clearer picture and sound, transforming footage recorded on a standard microphone into a well-processed version, converting black-and-white footage recorded on cameras into colour, and bringing photographs to life have been developed. For example, the Adobe Podcast AI service works with audio and helps remove any audio defects: echoes, background noise, distortion, and variations in the volume of speakers [6].

Neural networks such as Deep Nostalgia can bring old photos to life. Videos of this kind were developed as part of the BELTA news agency's "Ожившие фото" project [7]. This capability of neural networks helps to preserve memories and heighten the emotions evoked by old photos. One can also observe even more impressive results from modern neural networks, such as Runway Gen-4.5 and Kling 3.0.

With Runway Gen-4.5 neural network it is possible to change the lighting of a scene, restyle a shot or subject, add or remove elements from a take (Figure 1). Also, the neural network can turn a single image into a campaign mood board. Runway Gen-4.5 allows users to generate complex visual effects, change a model's style, capture facial movements and transpose them directly onto a reference character (Figure 2) [8].

Kling 3.0 is another example of modern, advanced neural networks. It supports realistic video generation up to 15 seconds, enables native audio-visual output, highly flexible storyboard control and more precise semantic response accuracy, injecting vitality into AI-generated visual content (Figure 3) [9].

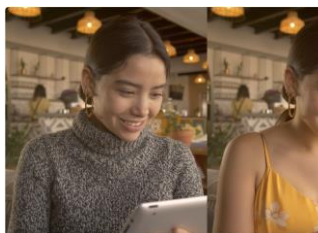


Figure 1 – A still from a video generated by the Runway neural network, showing the girl changing her clothes



Figure 2 – A still from a video generated by the Runway neural network, demonstrating the capture of a human face's movements and their application to a reference character



Figure 3 – A still from a video generated by the Kling 3.0 neural network [10]. Prompt: "A man and a woman outdoors; the camera zooms in as they talk"

It should be noted, that advances in AI have also transformed the economic landscape of the video production industry.

First of all, according to industry analyses, production costs for studios implementing AI workflows have decreased by approximately 22–35 %. Whereas animation was previously valued primarily on the basis of production hours, the use of AI has shifted the focus towards value-based pricing models. Streaming platforms are increasing their use of AI animation tech, boosting commissioned content by 32 % even as they hold steady or cut budgets.

Moreover, recent financial data shows substantial capital flowing into AI animation technologies, with venture funding increasing by nearly 45 % since 2023.

Remarkably, that researches also reveal the emergence of a multifaceted employment landscape in the animation sector. Approximately 204,000 positions within the entertainment industry may experience substantial disruption over the next three years, with animation roles proving especially susceptible. However, such disruption does not invariably equate to job elimination. Such jobs as AI animation supervisor, prompt engineer, AI-Human collaboration specialist are appearing [11].

To sum up, since its inception and up to the present day, AI has undergone revolutionary changes that are impacting many areas of society. Previously, it was unimaginable that a machine could create videos and assist humans in editing them to achieve high-quality results. Now this is a reality. AI models are actively making inroads into the field of video production: they are used to create films and mass-market videos, and their application has given rise to new themes and directions not only in video production but also in other creative professions. Neural networks have also had an impact on the economic landscape. Their development has led to the creation of new specialisms and raised questions for some members of the creative professions regarding the stability of their jobs. But unfortunately, the issue of copyright for materials generated by neural networks still remains unresolved.

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