



AI Video Editor: A Conceptual Review in Generative Arts

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Abstract. This paper presents a conceptual review of AI Video Editors in generative arts. With the exponential growth of video content on various platforms, the need for efficient video editing tools has become crucial. Traditional video editing processes often require significant human effort and time. However, recent advancements in Artificial Intelligence (AI) have paved the way for automated video editing solutions. This paper provides a comprehensive review of AI video editors, discussing their underlying technologies, advantages, limitations, and potential future developments. It aims to guide researchers, developers, and practitioners in understanding the current state of AI video editing and its potential impact on the creative industry.

Keywords: Artificial Intelligence, Generative Arts, Video Editing Tools

1 Introduction

AI and art encompasses a range of activities and research that can be broadly categorized into two groups: (1) utilizing AI for the analysis of pre-existing art, and (2) leveraging AI to generate new artistic creations (Cetinic, 2022).

The advent of Artificial Intelligence (AI) has brought significant advancements and transformative changes to various industries, including video editing. One of the most notable developments in the field of AI video editing is its integration with popular video editing software such as Adobe Premiere and other video AI editors. These AI-powered tools have revolutionized the way professionals and enthusiasts approach video editing by automating tedious tasks, enhancing creativity, and improving overall efficiency.

AI video editing in the realm of generative arts is an exciting and rapidly evolving field. Generative arts involve the use of algorithms, machine learning, and artificial intelligence to create unique and innovative artistic creations. With AI video editing,

you can leverage the power of AI to automate and enhance various aspects of the video editing process.

In this paper, we explore the integration of AI in Adobe Premiere and other video AI editors, analyzing their key features, functionalities, and the impact they have on the video editing landscape. We delve into the underlying AI technologies employed, such as machine learning algorithms, computer vision, natural language processing, and deep neural networks, which enable these tools to perform advanced tasks and empower users with new possibilities.

The integration of AI in Adobe Premiere and other video AI editors offers a range of benefits. Firstly, these tools provide intelligent automation for time-consuming tasks like video stabilization, noise reduction, and color grading. This automation enables editors to focus more on the creative aspects of their work, allowing them to experiment and explore their artistic vision. Additionally, AI algorithms can analyze and understand video content, facilitating automated scene detection, object recognition, and content segmentation, which significantly speeds up the editing process.

Furthermore, the inclusion of AI-powered features in these editors expands the range of creative possibilities for users. For instance, AI can generate subtitles and captions automatically, eliminating the need for manual transcription. AI-based style transfer algorithms can transform the visual aesthetics of videos, allowing editors to achieve different looks and moods easily. Moreover, AI can facilitate intelligent content suggestions, recommending relevant stock footage, music, or effects based on the video's context, saving time and enhancing the overall quality of the final product.

While the integration of AI in Adobe Premiere and other video AI editors brings numerous advantages, it also raises important considerations. These include the need to address ethical concerns related to bias, privacy, and the potential misuse of AI-generated content. It is crucial to ensure transparency, accountability, and user control over AI-powered features to maintain trust and uphold ethical standards.

In this paper, we will examine the current state of AI integration in Adobe Premiere and other video AI editors, discussing the benefits, challenges, and potential future developments. By gaining insights into the capabilities and implications of AI in video editing software, researchers, professionals, and enthusiasts can harness the power of these tools to unlock new levels of creativity, efficiency, and innovation in the ever-evolving field of video editing.

2 Literature Review

2.1 Generative AI (Gen AI) refers to a form of Artificial Intelligence that harnesses the ability to generate diverse types of data, including images, videos, audio, text, and 3D models. By leveraging the knowledge acquired from analyzing existing data patterns, GenAI can produce novel and distinct outputs. (Bozkurt,2023). This technology exhibits remarkable capabilities in generating sophisticated and lifelike content, closely emulating human creativity. Consequently, it has found substantial utility in various industries like gaming, entertainment, and product design. Recent breakthroughs in the field, exemplified by advancements like GPT (Generative Pre-trained Transformer) and Midjourney, have significantly propelled the capabilities of GenAI to new heights. These developments have unlocked fresh opportunities for employing GenAI in addressing intricate problems, fostering artistic endeavors, and even facilitating scientific research.

Popular feature of AI video editing includes transferring facial expressions from one video to another in real-time. It utilizes a deep neural network to generate accurate and realistic facial animations, enabling applications in video editing and character animation (Kim, 2018).

AI video capabilities includes video retrieval by text (Dong,2021), Object Recognition and Tracking , Facial Recognition , Scene Understanding (Breuer,2017) , Video Summarization , Speech and Audio Recognition , Video Generation and Synthesis , Video Content Analysis , Video Compression and Enhancement. Video retrieval by text where a query is described exclusively in the form of a natural-language sentence, with no visual example attached (Zhang,2023)

The misuse of AI-generated videos, particularly in the form of deepfakes (Kietzmann,2022) poses significant threats such as revenge porn, bullying, fabrication of video evidence or news, blackmail, and political sabotage. These malicious applications can severely impact the lives of targeted individuals, causing immense hardship and harm. (Kingra,2023)

3 AI Video Tools

Some of the common features of AI video editors includes : Object Recognition and Tracking. AI algorithms can analyze video frames and identify and track specific objects or subjects, such as people, vehicles, or animals. This capability is commonly used in surveillance systems, autonomous vehicles, and video editing software.

Facial Recognition: AI can analyze facial features and patterns in videos to identify individuals. This technology has applications in security systems, video analysis, and personalized content delivery.

Scene Understanding: AI algorithms can analyze video content to understand the scene, identify objects, and extract relevant information. This capability is used in video surveillance, video search, and content recommendation systems.

Video Summarization: AI can automatically analyze video content and generate concise summaries, highlighting the most important events or key moments. This capability is useful for saving time in video review, generating video previews, and creating video highlights.

Speech and Audio Recognition: AI-powered speech recognition algorithms can transcribe spoken words in videos, enabling features like automatic closed captions, video search based on spoken content, and voice-controlled video editing.

Video Generation and Synthesis: AI can generate new video content based on input data, such as text descriptions or images. This includes applications like deepfake technology, where AI can create realistic videos by manipulating or replacing elements in existing footage.

Video Content Analysis: AI algorithms can analyze video content to detect and classify various objects, scenes, activities, or anomalies. This capability is used in video surveillance, video content moderation, and video recommendation systems.

Video Compression and Enhancement: AI techniques can be used to improve video compression algorithms, reducing file sizes while maintaining visual quality. Additionally, AI can enhance video quality by reducing noise, sharpening details, or upscaling resolution.

These are just a few examples of the capabilities that AI brings to video processing and analysis. As AI technology continues to advance, we can expect even more sophisticated and powerful video-related applications in the future.

Table 1. Comparison of several popular Video Editor with AI capabilities :

	Adobe Premiere Pro	Runway ML	Topaz Video AI	DaVinci Resolve
Platform	Windows / Mac	Web	Windows / Mac	Windows / Mac
Object / face Recognition	Yes	Yes	Yes	Yes
Object Removal	Yes	Yes	Yes	Yes
Speech Recognition e.g. Auto Subtitle	Yes	Yes	Yes	Yes
Video Generation and Synthesis	No	Yes	No	No
Other features	Morph Cut , Auto Reframe	Frame Interpolation	upscales low-res to higher resolutions	Text-based editing virtual lighting

4 Application of AI Video in Generative Arts

Generative video using AI involves using artificial intelligence algorithms to create new video content based on existing data or models. Here are a few approaches to generative video using AI:

Style Transfer: AI algorithms can apply the artistic style of one video or image to another, resulting in a new video with a different visual style. This technique, known as style transfer, uses deep learning algorithms to extract and blend the style and content features of two videos, creating a unique and visually appealing output.

Video Synthesis: AI models like generative adversarial networks (GANs) can generate new video content by learning from a large dataset of existing videos. These models can learn the patterns, motions, and characteristics of the training videos and generate novel content that resembles the training data.

Video Prediction: AI models can be trained to predict future frames or actions in a video sequence based on the preceding frames. By leveraging temporal information, these models can generate plausible future frames, resulting in a video that simulates the continuation of the input video.

Video Completion: AI algorithms can analyze incomplete or damaged video footage and intelligently fill in the missing or corrupted parts to create a complete and visually coherent video. This technique can be particularly useful in video restoration and reconstruction tasks.

Video Editing Assistance: AI can assist in automating or suggesting edits for videos. For example, AI algorithms can analyze a long video recording and automatically generate shorter highlight reels or summarize the video's content by selecting key moments.

5 Limitation of AI Video Tools

While AI-powered video editors offer various advantages and capabilities, they also have certain limitations. Here are a few limitations of AI video editors to consider:

The issue of authenticity arises when questioning whether generative art can truly be considered art, considering that it is partially created by an unemotional and unthinking system. Some argue that generative art does not qualify as art at all. (Galanter ,2019) Exploring this critique leads us to delve into a fundamental question of art theory: "What defines art?"

Contextual Understanding: AI video editors may struggle with understanding the contextual nuances and subtle elements in a video. They might not fully comprehend

the specific intent or emotion behind certain scenes, leading to potential inaccuracies in editing decisions.

Creative Judgment: Video editing often involves subjective creative decisions based on artistic intent. AI video editors may lack the human touch and creative judgment required to make nuanced decisions about pacing, timing, and overall aesthetics, which can impact the quality of the final edit.

Complex Editing Techniques: AI video editors may have difficulty with more advanced and complex editing techniques that require intricate control and precision. Tasks such as intricate transitions, advanced visual effects, or intricate color grading may be challenging for AI algorithms to execute at the same level as experienced human editors.

Training Data Bias: AI video editors heavily rely on training data to learn patterns and make editing decisions. If the training data is biased or limited in terms of diversity, it can lead to biased or suboptimal editing choices.

Lack of Human Intuition: Human editors often rely on their intuition, experience, and creativity to make editing decisions. AI video editors, on the other hand, lack this human intuition, which can sometimes result in less nuanced or less emotionally impactful edits.

Limited Adaptability: AI video editors are typically designed to perform specific tasks or follow predefined algorithms. They might struggle to adapt to unique or unconventional editing requirements, which could limit their flexibility in handling unconventional video projects.

Real-time Editing Challenges: AI video editing algorithms may require significant computational resources and processing time, making real-time editing or quick iterations challenging. This can be a limitation when immediate editing decisions or feedback are required.

6 Conclusion

In conclusion, generative video using AI offers exciting possibilities for creating new and unique video content. AI algorithms can leverage techniques such as style transfer, video synthesis, video prediction, video completion, and video editing assistance to generate videos with different visual styles, create entirely new content, predict future frames, fill in missing parts, or automate certain editing tasks.

While AI has made significant advancements in generative video, there are still limitations to consider. AI algorithms may struggle with contextual understanding,

lack human intuition and creative judgment, and may require extensive computational resources for real-time applications. The quality and capabilities of the generated content can vary based on factors such as the complexity of the task, the quality and diversity of the training data, and the sophistication of the AI algorithms employed.

Generative video using AI is an active area of research and development, and it holds great potential for various applications, including artistic expression, video synthesis, restoration, and automated video editing. As technology advances, we can expect further improvements and innovations in generative video using AI, expanding the possibilities for creative video content creation.

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