AI ENHANCED VIDEO EDITOR

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Abstract

The AI-Enhanced Video Editor is an advanced tool designed to simplify and elevate the process of content creation for video editors, social media influencers, and other creative professionals. Leveraging state-of-the-art Generative AI technologies, it incorporates Whisper for accurate transcription, MoviePy for dynamic video editing, OpenCV for image and video processing, and Transformers for powerful AI-driven functionalities. This editor offers an intuitive interface combined with scalable architecture to ensure a smooth and efficient user experience. Its robust API integrations enable seamless incorporation of AI tools into workflows, making it adaptable to diverse editing needs. Security is a core focus, with end-to-end encryption protecting user data during transfer. Built on a modern technology stack, the tool uses frameworks like React.js and Flask, Material-UI for a responsive interface, React Router for streamlined navigation, and Python as the primary programming language. Additional tools such as gTTS and Pydub enhance its audio processing capabilities, providing а comprehensive suite for media editing. The AI-

Enhanced Video Editor empowers users to produce high-quality content effortlessly, bridging the gap between conventional editing tools and cutting-edge AI innovations. It is tailored to meet the growing demands of the digital age while ensuring scalability, efficiency, and robust security for content creators.

Introduction

The AI-Enhanced Video Editor is an innovative software solution designed to transform the way photo and video content is created, edited, and shared. Tailored to meet the needs of content creators, video editors, and social media influencers, this tool combines cutting-edge Generative AI technologies with a user-friendly interface and advanced functionality. It integrates Whisper by OpenAI for accurate transcription, MoviePy for seamless video editing, OpenCV for precise image and video processing, and Transformers for delivering powerful AI-driven capabilities. With a focus on scalability and adaptability, the AI-Enhanced Video Editor supports seamless API integrations, allowing users to incorporate its features into diverse workflows. Its intuitive design ensures accessibility for beginners while

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offering advanced tools that cater to professionals. Built on a robust technology stack-featuring frameworks like React.js and Flask, Material-UI for dynamic interfaces, and Python as the core programming language—the platform delivers efficiency and reliability. A key highlight of the AI-Enhanced Video Editor is its commitment to security. End-to-end encryption safeguards user data during transfers, ensuring privacy and trust. Additionally, tools like gTTS and Pydub extend its capabilities to include highquality audio processing, creating a comprehensive solution for modern media editing. In an era where digital content drives communication and engagement, the AI-Enhanced Video Editor stands out as a forwardthinking platform. It bridges the gap between traditional editing tools and advanced AI technologies, enabling users to produce professional-quality content with minimal effort. This tool is more than just an editor; it is a complete ecosystem designed to empower creators and enhance their creative potential.

Literature Review

The rapid growth of digital media has led to an increased demand for advanced editing tools that can produce high-quality content with efficiency and precision. Traditional photo and video editing tools, while effective, often require significant manual effort, time, and technical address expertise. То these limitations. researchers and developers have explored the integration of artificial intelligence into media editing. AI-driven tools have shown immense potential to automate repetitive tasks, enhance creative workflows, and improve overall

productivity. For instance, Whisper by OpenAI, a state-of-the-art transcription model, has been widely recognized for its ability to convert speech into text with remarkable accuracy, making it ideal for applications in subtitling and video annotation. Similarly, MoviePy, an open-source Python library, has demonstrated its versatility in automating video editing tasks such as trimming, compositing, and adding effects. OpenCV, another open-source library, is extensively used for image and video processing, offering features such as object detection, facial recognition, and Transformers, with their motion tracking. unparalleled ability to process and generate human-like text, have paved the way for AIpowered functionalities like script generation, context-based editing, and recommendation systems. The AI-Enhanced Video Editor builds on this foundation by combining these proven technologies into a single, cohesive platform. Existing studies have highlighted the importance user-centric design in media tools, of emphasizing the need for intuitive interfaces that cater to both beginners and professionals. The integration of Material-UI in this tool ensures a responsive and visually appealing design, while frameworks like React.js and Flask facilitate seamless functionality and scalability. Literature on secure data handling underscores the growing concerns around privacy in digital tools, and the AI-Enhanced Video Editor addresses this through end-to-end encryption to protect user data during transfer. Additionally, research on audio processing tools like gTTS and Pydub highlights their effectiveness in enhancing multimedia projects through high-quality voice synthesis and audio manipulation. By leveraging these

advancements, the AI-Enhanced Video Editor not only aligns with existing research but also addresses gaps in traditional editing tools, such as lack of automation and scalability. Its design reflects a comprehensive understanding of user needs, blending technical sophistication with practical usability. This literature review underscores the tool's significance as a modern solution for the challenges of digital content creation, offering a balanced approach that combines innovation, security, and ease of use.

Existing Approach

Photo and video editing tools have evolved over the years to meet the needs of content creators and professionals. Traditional software like Adobe Premiere Pro, Final Cut Pro, and DaVinci Resolve offer extensive features but often have steep learning curves, high costs, and require resource-heavy systems. On the other hand, lightweight tools like CapCut, InShot, and Canva focus on simplicity, making them ideal for casual users but lack advanced features and scalability for professional projects.

AI-driven tools have started bridging this gap, offering functionalities such as automated scene detection, object tracking, and speech-totext transcription. For instance, Whisper by OpenAI excels in transcription, OpenCV in image processing, and MoviePy in Python-based video editing. However, most existing tools focus on isolated functionalities, forcing users to rely on multiple software solutions to complete their projects.

Security and integration are also common challenges. Many cloud-based tools lack robust data encryption, leaving users vulnerable to breaches, and fragmented workflows caused by poor integration hinder efficiency. The AI-Enhanced Video Editor overcomes these limitations by uniting the strengths of various tools into a single platform. It combines AI technologies like Whisper, MoviePy, OpenCV, and Transformers to deliver an intuitive, scalable, and secure editing solution. By automating repetitive tasks and ensuring endto-end encryption, it provides a seamless and innovative approach to content creation.

Proposed Approach

The proposed approach for the AI-Enhanced Video Editor integrates advanced AI technologies to create a seamless, user-friendly platform for content creators, video editors, and social media influencers. By combining powerful tools like Whisper for transcription, MoviePy for video editing, OpenCV for image processing, and Transformers for AI-driven capabilities, the editor automates tedious tasks such as speech-to-text conversion, scene detection, and object tracking. This not only reduces manual effort but also accelerates the editing process, allowing creators to focus more on content quality rather than technical challenges. The tool's scalable architecture ensures it can handle projects of varying sizes, from simple social media posts to complex video productions.

In addition to its technical capabilities, the AI-Enhanced Video Editor emphasizes robust security and seamless user experience. With end-to-end encryption, it prioritizes data privacy, making it a secure choice for professionals working with sensitive content.

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The platform's intuitive design, built with React.js and Flask, ensures that both beginners and experienced users can navigate its features effortlessly. By combining automation, security, and an easy-to-use interface, the proposed approach offers a comprehensive solution that meets the evolving needs of digital content creation while setting itself apart from traditional editing tools.

Flow diagram



List of modules and its working:

1. Home Page

The home page of the AI Enhanced Video Editor provides a clean and user-friendly interface that welcomes content creators, video editors, and influencers. It serves as the central hub for navigating the app's features and tools. From here, users can easily upload their raw video or photo, begin editing, and explore various AI-driven functionalities, such as transcription, background removal, and image generation. The design is intuitive, allowing users of all technical levels to access advanced tools effortlessly.

2. Upload Photo and Video to App

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3. Remove Background

One of the standout features of the AI Enhanced Video Editor is its ability to remove backgrounds from images and videos. Whether the content creator is looking to remove a distracting background from a video clip or needs to isolate an object in an image, this tool provides a quick solution. Using advanced AI algorithms, the editor detects the subject in the image or video and removes the background while retaining fine details. The background removal tool is highly accurate, even in complex scenes, making it ideal for professional-level video production and content creation.

4. Generate Image

The AI Enhanced Video Editor offers a powerful image generation tool that helps content creators produce high-quality visuals for their videos or social media content. By simply inputting text prompts or selecting predefined templates, the tool uses AI to generate images that match the user's requirements. These images can range from product mockups to creative backgrounds or themed graphics. This feature saves time for content creators, as they don't need to manually search for or create images from scratch. The generated images can be directly added to videos or used for thumbnails, posts, or other content creation purposes.

5. Output Video

After editing, the AI Enhanced Video Editor provides an option to render the final output video. The tool seamlessly combines all the elements – such as transcribed text, background-removed visuals, and generated images – into a high-quality video file. The user can choose the resolution and format that best suits their needs. The app ensures that the video is optimized for various platforms, whether for YouTube, Instagram, or TikTok. The rendering process is fast and efficient, maintaining the highest quality while delivering the finished video in minimal time.

6. Code Summarizer & Debugger

The AI Enhanced Video Editor also includes a code summarizer and debugger, designed to assist developers who are integrating or customizing the tool. For users working with the underlying codebase, this feature simplifies the process of understanding and troubleshooting the code. The code summarizer condenses complex sections of code into clear, concise summaries, making it easier for developers to grasp the logic and structure. Additionally, the debugger helps identify and fix issues in the code, ensuring smooth operation of the app and enhancing the overall user experience. This feature is especially useful for developers who wish to extend or adapt the app's functionality for specific use cases.

Result

The AI Enhanced Video Editor is designed to streamline the video editing process for content creators, video editors, and social media influencers. The platform begins by allowing users to effortlessly upload raw videos or images, with the system automatically processing these files using advanced AI technologies. The Whisper AI transcription tool accurately converts speech into text, making it easy to identify and remove unwanted silences or mistakes in the video. This automatic process saves significant time for creators, allowing them to focus on more creative aspects of their projects. For those who need to refine their visuals, the background removal tool offers a fast and accurate solution to remove unwanted backgrounds from images or videos, preserving the integrity of the subject. The AI Enhanced Video Editor also features a powerful image generation tool, enabling users to create high-quality visuals directly within the app. Whether through text prompts or template selections, users can generate professional-grade images that fit perfectly into their content. After editing, the platform allows for quick and efficient video rendering, ensuring that the final product is high-quality and ready for distribution on social media platforms like YouTube, Instagram, or TikTok. The video output is optimized for each platform's specific requirements, ensuring the best viewing experience for audiences. For developers working with the platform, the built-in code summarizer and debugger provide an invaluable resource for understanding and troubleshooting the app's underlying code.

Conclusion

the AI Enhanced Video Editor is a powerful, user-friendly platform designed to simplify the video and photo editing process for content creators, video editors, and social media influencers. By leveraging advanced AI technologies such as Whisper for transcription, background removal, and image generation, the tool significantly reduces the time and effort required to produce professional-quality content. With its intuitive interface, seamless upload process, and efficient output generation, the editor empowers users to focus on creativity rather than technical challenges. Additionally, the inclusion of a code summarizer and debugger makes the platform adaptable for developers, enhancing its versatility. Overall, the AI Enhanced Video Editor delivers an all-in-one solution for content creation, making it an invaluable tool for those looking to elevate their multimedia projects.

Future Work

Future work for the AI Enhanced Video Editor will focus on improving AI capabilities, such as more accurate transcription and real-time collaboration tools. We aim to expand integration with additional social media platforms and optimize performance for faster processing of high-resolution videos and large files.

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