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Automatic Video Generator

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Abstract:
The Video Generator System is an innovative application that transforms user inputs into dynamic video content. It integrates user registration, authentication, and interactive modules for generating stories based on prompts. These stories are further converted into videos, which can be instantly viewed in the browser. The system leverages Python and MySQL for efficient backend processing and data management. By combining text-to-video capabilities with a user-friendly interface, this project provides a streamlined solution for creating personalized video content, showcasing the potential of integrating storytelling and video generation technologies. The objective of paper To Develop a system that automates the creation of videos from a text-based story prompt using AI technologies. The project automates video creation from text prompts using AI tools. • GPT-2 generates the story, pixabay API creates images, and gTTS produces voiceovers. • Captions are generated from the story and combined with images and audio • The result is a fully automated system for turning text into engaging videos.

I. INTRODUCTION

The Automatic Video Generator Project uses AI to turn text-based stories into complete videos, combining story generation, image creation, voiceovers, and editing into a single platform. Background: The growing need for video content highlights the importance of simplifying production, since traditional methods require a lot of time, effort, and skilled workers.

1.1 **Overview**

The existing video generation systems rely heavily on either pre-recorded templates or manually edited multimedia content. These approaches demand significant time, effort, and expertise, often making them inaccessible to non-professional users. While some systems utilize AI or automation for video creation, they frequently lack modularity and user interaction. Many such systems cannot generate content dynamically based on user inputs, failing to meet personalized or story-driven video creation requirements. Additionally, the integration of features such as story generation, image processing, and voice-over synthesis is rarely seamless in a single framework.

Current video creation tools are manual, requiring user expertise in editing and scripting, while existing automated solutions fail to provide a cohesive workflow that integrates story generation, image creation, and voiceover synthesis Existing System and Its Limitations

1.2 Existing System and Its Limitations

The current video generation systems face several limitations that restrict their efficiency and user-friendliness:

1. **Dependency on Static Data**: Most systems rely on pre-recorded templates or predefined multimedia content, limiting dynamic content generation.
2. **Lack of Personalization**: They often fail to adapt content to user-specific requirements or preferences, reducing their appeal for personalized video creation.
3. **Fragmented Workflows**: Users are required to switch between multiple tools for tasks such as story generation, image processing, and voice-over synthesis, leading to inefficiencies and a steeper learning curve.
4. **High Expertise Requirements**: The manual editing process demands significant technical skills, making these systems inaccessible to non-professional users.
5. **Limited Real-Time Capabilities**: Many systems cannot support real-time rendering, making them unsuitable for on-demand video generation.

6. **Poor Integration with AI Tools**: Existing systems often lack integration with natural language processing or AI-based tools, restricting their ability to generate story-driven or interactive content dynamically.
7. **Time and Resource Intensive**: These systems require substantial time and effort for video creation, which reduces their practicality for quick or frequent use cases.

1.3 Proposed System:

The proposed system is an AI tool that turns written stories into videos using advanced technologies for generating stories, images, and voiceovers, making video creation quick and easy for everyone. . The proposed video generation system provides an all-in-one solution for creating personalized videos by integrating key functionalities within a unified framework. Built using Django, it enables users to seamlessly generate videos from text prompts, incorporating modules for user authentication, story generation, image processing, voice-over synthesis, and video compilation. By utilizing machine learning and multimedia libraries, the system dynamically creates videos tailored to user-defined prompts, eliminating reliance on static templates.

One of the primary advantages of this system is its **end-to-end automation**, where users can input a story idea, and the system handles all steps, including narrative generation, image retrieval, captioning, voice-over synthesis, and video compilation. This streamlines the process, reduces complexity, and requires no technical expertise, making it accessible to a wider audience. The modular architecture also ensures scalability and reusability, with the database facilitating user management and storing generated content for future use.

The system leverages advanced tools such as **moviepy**, image search APIs, and voice synthesis modules to deliver high-quality outputs. Its web-based implementation ensures accessibility across devices, offering a user-friendly interface for real-time video creation. Furthermore, the modular design allows easy enhancements, such as integrating AI-based customizations for voice or image processing, ensuring flexibility for future improvements.

While the proposed system significantly improves upon existing limitations, such as fragmented workflows and lack of personalization, challenges remain in generating complex video narratives or ensuring visual coherence in all outputs. However, its ability to create dynamic, personalized videos with minimal effort marks a substantial advancement in automated video generation technologies.

LITERATURE SURVEY

Literature Survey for Video Generator System

Introduction

A literature survey is an essential component of research that reviews and analyzes the current body of knowledge surrounding a particular field. In this context, the literature survey explores the various video generation techniques, their challenges, and ongoing developments, with a focus on AI-powered solutions. It provides an understanding of existing systems, their limitations, and lays the foundation for the proposed video generator system that automates the creation of videos from user-generated stories.

Existing Theories on Video Generation

Video generation involves combining multiple media types (images, text, voice, etc.) into a cohesive visual and auditory presentation. Existing approaches typically rely on either static templates or pre-recorded assets to create videos. A notable development in this field has been the use of generative adversarial networks (GANs) for dynamic content creation, specifically StyleGAN and its variants like StyleGAN2, which generate high-quality images and, to an extent, video content. However, these techniques are primarily focused on generating individual images, with little emphasis on seamless integration of story-driven content and voice synthesis for real-time video creation.

The theory behind integrating NLP (natural language processing) with video generation, such as StoryGAN or similar techniques, aims to

generate video content based on a user's textual input. This approach is evolving but remains limited in terms of dynamic, real-time content creation. While these technologies offer some automation, they are often disjointed, requiring users to manually input each element, such as text, images, and voice, into different software tools.

Books and Research on Video Generation

The development of video generation systems has been explored in several academic studies. Research papers such as **"StyleGAN-V: A Continuous Video Generator"** and **"Video-to-Video Synthesis"** investigate advanced techniques for video generation using deep learning algorithms like GANs, deep reinforcement learning, and video-to-video synthesis, where the primary challenge is generating a sequence of coherent frames based on specific input. However, these solutions often lack the integration of multi-modal elements, such as automatically generated images, voiceovers, and storylines, all within a unified framework.

Books like **"Deep Learning for Computer Vision"** by Rajalingappaa Shanmugamani and **"Hands-On Computer Vision with TensorFlow 2.0"** provide a theoretical foundation for the methods used in image generation and video synthesis. While these resources provide insights into the tools used in the underlying video generation algorithms, they lack a comprehensive guide to building systems that integrate all aspects of video creation.

Challenges and Ongoing Work

Existing systems often face significant challenges in video creation, including poor integration between different media types (e.g., story, images, and voiceovers). The lack of automation for combining these elements results in inefficient workflows where users must manually coordinate image selection, text-to-speech synthesis, and video editing. Some platforms do offer AI-driven image generation and voice synthesis, but they are often limited to specific use cases or require expert-level knowledge to operate.

The biggest challenge is creating a seamless integration of these elements in real time. Many systems lack the necessary real-time rendering capabilities or are fragmented across multiple tools. For instance, tools like **DeepArt** or **RunwayML** enable the user to generate content, but the workflows are not integrated, meaning users still need to move between different software tools to complete the video creation process. Additionally, platforms that offer dynamic story-based video generation are still in early stages, and few have fully optimized natural language processing (NLP) algorithms that create stories coherent enough for video generation.

Proposed Solution

The proposed system integrates multiple functionalities—story generation, image search, voice synthesis, caption creation, and video editing—into a unified platform. This approach aims to streamline the process of video creation and eliminate the need for users to use multiple separate tools for each stage. By allowing users to input a prompt that automatically generates a story, images, and a corresponding voiceover, this system offers a high level of automation while still enabling user interaction for content customization.

The system utilizes advanced technologies such as NLP for story generation, image retrieval using deep learning-based search techniques, and voice synthesis algorithms. Additionally, the integration of libraries like **moviepy** for video editing and **pymysql** for backend data management ensures a seamless experience for users while maintaining flexibility for future upgrades.

This literature survey highlights the rapid evolution of video generation technologies and identifies key areas where current systems fall short. The proposed system leverages existing theories and methodologies, combining them into a single, efficient framework that aims to overcome the limitations of existing systems. By automating the process and enabling real-time generation of videos based on user-generated stories, the proposed solution addresses many of the current challenges in the field of video creation.

Objectives of Literature Survey for Video Generator System

1. **Understand Existing Video Generation Methods**: Explore the current state of video generation techniques, including template-based, AI-powered, and manual editing approaches, to identify gaps and areas of improvement.
2. **Investigate AI Integration in Video Creation**: Review how AI, machine learning, and natural language processing (NLP) are being applied to automate video creation, focusing on narrative generation, image synthesis, and voice-over integration.
3. **Evaluate Image Processing in Video Generation**: Study methods used for automated image retrieval, captioning, and integration into video clips, understanding their efficiency, quality, and adaptability to various video themes.
4. **Examine Voice Synthesis Technologies**: Research the state-of-the-art methods in voice synthesis, particularly for generating natural-sounding voiceovers from textual content, and their integration into multimedia applications.
5. **Assess Video Editing and Compilation Tools**: Explore current video editing software and libraries, like moviepy, to understand their strengths and limitations in automating the video creation process, especially for dynamic content.
6. **Identify User Interaction and Personalization Techniques**: Investigate approaches that allow for user-driven content creation, ensuring systems are intuitive, flexible, and capable of meeting individual preferences in video production.
7. **Review Real-Time Video Rendering Solutions**: Examine existing systems' capabilities in real-time rendering and video generation, determining the feasibility of on-demand video creation with high-quality results.
8. **Explore Web-Based Video Generation Frameworks**: Analyze web-based solutions for video generation, focusing on their accessibility, scalability, and how they improve the user experience compared to desktop applications.

creation with captions), we can confirm that the **Automatic Video Generator** works as expected, offering a seamless process for users to create and share video content from simple text inputs. This ensures that all elements—story generation, image fetching, voiceover production, video editing, and caption syncing—function cohesively.

DISCUSSION OF RESULTS

We have converted your code into web module and to run code install python 3.7.2 and then install all packages given in requirements.txt file and then install MYSQL database and then copy content from 'db.txt' file and paste in MYSQL console to create database.

To implement this project we have designed following modules

1) New User Signup Here: using this module user can sign up with the application
2) User Login: using this module user can login to system
3) Story Generator: using this module user can enter some prompt to generate story and after story generating user can generate video which will start playing in browser
4) Video Generator: after getting story user can click on 'Generate Video' button to generate video which will play in browser

After creating database double click on 'run.bat' file to start python web server and get below page

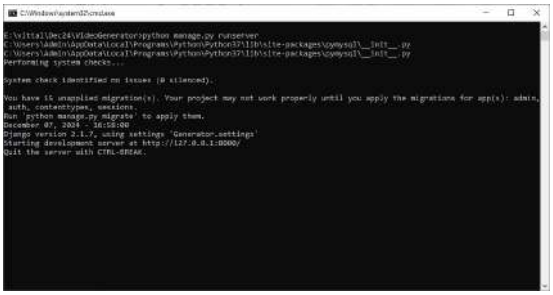

Fig.7.1 web server started

In above screen python web server started and now open browser and enter URL as http://127.0.0.1:8000/index.html and then press enter key to get below page

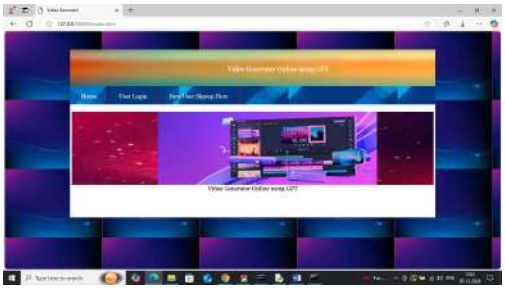

Fig7.2 New User Sign up

In above screen click on 'New User Sign up' link to get below page

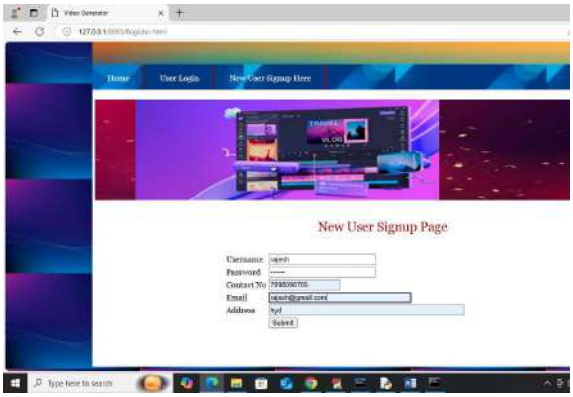

Fig.7.3 user is entering sign up details

In above screen user is entering sign up details and then press button to get below page

Fig.7.4 user sign up completed

In above screen user sign up completed and now click on 'User Login' link to get below page

Fig.7.5 user is login

In above screen user is login and after login will get below page

Fig.7.6 Story Generator

In above screen click on 'Story Generator' link to get below page

Fig.7.7 entering some prompt in text field

In above screen enter some prompt in text field and then press button to get below page

Fig.7.8 text area can see generated story text

In above screen in text area can see generated story text and now click on 'Generate Video' button to get below output

Fig.7.9 video successfully generated

In above screen video successfully generated and started playing.

Similarly by following above output you can generate video for any prompt.

CONCLUSION

The **Automatic Video Generator Project** harnesses cutting-edge AI technologies to streamline and enhance the video production process, allowing users to effortlessly create compelling videos from text prompts without requiring extensive editing expertise. By automating the process, it significantly reduces the time and effort typically involved in video creation, accelerating content delivery. The integration of AI tools such as GPT-2 for story generation, Pixabay for image sourcing, and gTTS for voiceovers facilitates a seamless and efficient storytelling experience. This innovative approach addresses current challenges in video creation, unlocking new creative possibilities and empowering users to produce high-quality videos quickly and easily.

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