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INDUSTRIAL ORIENTED MINI PROJECT

YouTube TRANSCRIPT SUMMARIZER

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TITLE JUSTIFICATION

- Thousands of video recordings are created and shared on the internet every day.

- It is becoming increasingly difficult to spend time to watch such videos, which may take longer than anticipated, and our efforts may go in vain if we are unable to extract meaningful information from them.

- An automatic transcript summarizer's purpose is to shorten the time of reading, enable easier selection, be less prejudiced compared to humans, and portray content that is compressed while preserving the important material of the actual document.

ABSTRACT

This project proposes a video summarizing system based on natural language processing (NLP) and Machine Learning to summarize the YouTube video transcripts without losing the key elements. The quantity of videos available on web platforms is steadily expanding. The content is made available globally, primarily for educational purposes. Additionally, educational content is available on YouTube, Facebook, Google, and Instagram. A significant issue of extracting information from videos is that unlike an image, where data can be collected from a single frame, a viewer must watch the entire video to grasp the context. This study aims to shorten the length of the transcript text of the given video. The suggested method involves retrieving transcripts from the video link provided by the user and then summarizing the text by using Hugging Face Transformers and Pipelining.

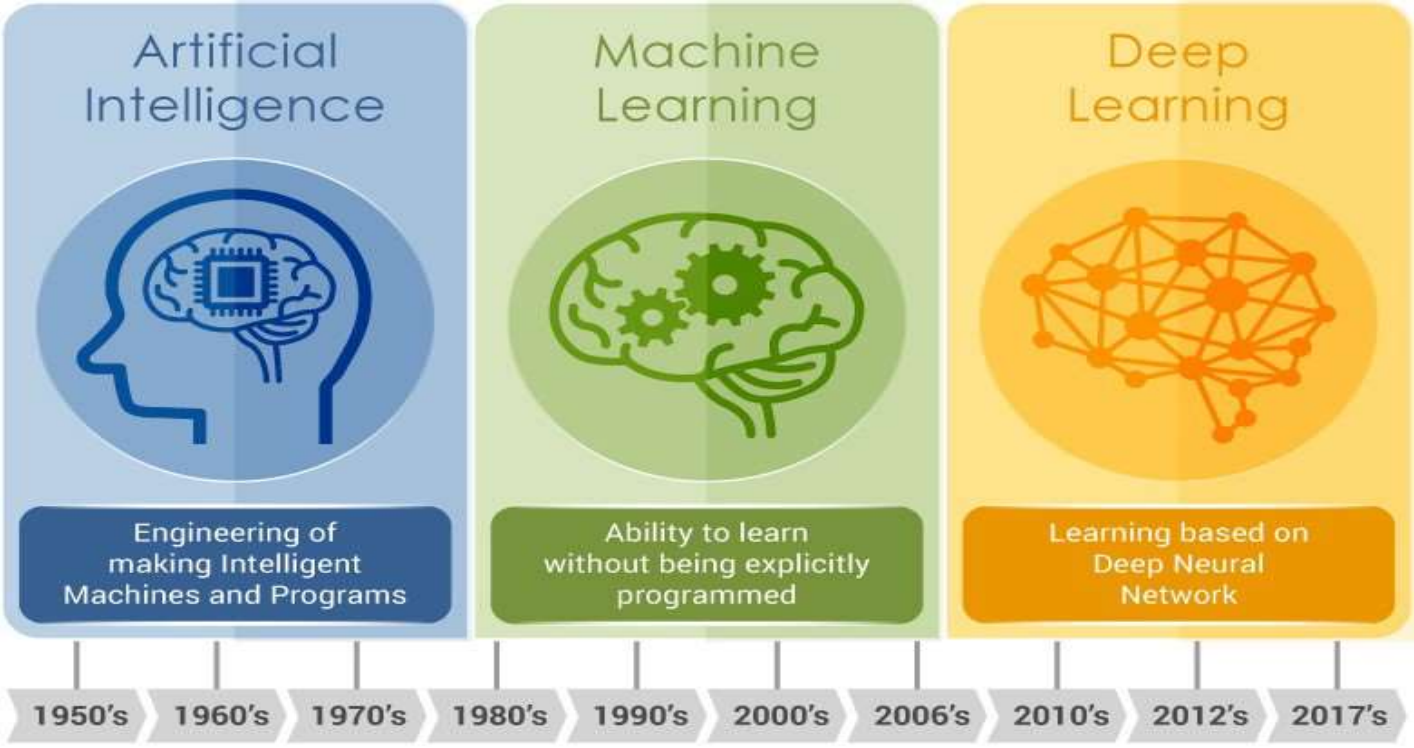
CONTINUATION

The built model accepts video links and the required summary duration as input from the user and generates a summarized transcript as output. According to the results, the final translated text was obtained in less time when compared with other proposed techniques. Furthermore, the video’s central concept is accurately present in the final text without any deviations.

DOMAIN INTRODUCTION

- ✓ Deep learning is a machine learning technique that teaches computers to do what comes naturally to humans: learn by example. Deep learning is a key technology behind driverless cars, enabling them to recognize a stop sign, or to distinguish a pedestrian from a lamppost.

- ✓ Machine learning is a branch of artificial intelligence (AI) and computer science which focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy.


Artificial Intelligence
Machine Learning
Deep Learning
Engineering of making Intelligent Machines and Programs
Ability to learn without being explicitly programmed
Learning based on Deep Neural Network
1950's
1960's
1970's
1980's
1990's
2000's
2006's
2010's
2012's
2017's

Continuation

- ✓ Machine learning and deep learning are both types of AI. In short, machine learning is AI that can automatically adapt with minimal human interference. Deep learning is a subset of machine learning that uses artificial neural networks to mimic the learning process of the human brain.

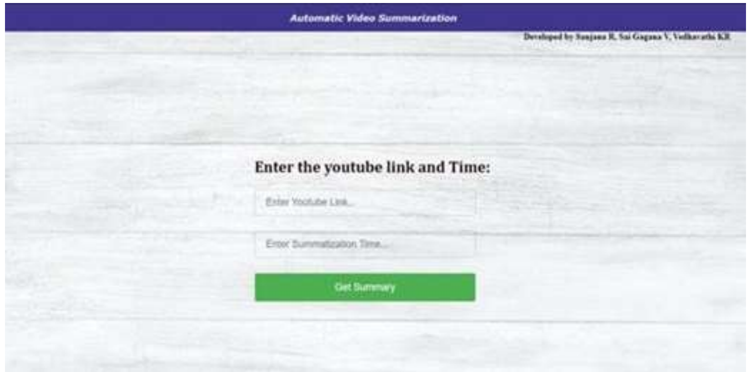
- ✓ In Natural Language Processing, or NLP, Text Summarization refers to the process of using Deep Learning and Machine Learning models to synthesize large bodies of texts into their most important parts. Text Summarization can be applied to static, pre-existing texts, like research papers or news stories, or to audio or video streams, like a podcast or YouTube video, with the help of Speech-to-Text APIs.

- ✓ Some Text Summarization APIs provide a single summary for a text, regardless of length, while others break the summary down into shorter time stamps.

EXISTING SYSTEM

- The proposed system takes input of a YouTube video link and the time duration to which video has to be summarized as shown in figure.

- Summarizing video based on it’s subtitle is the fastest way of generating video summary, because dealing with text is easier and faster compared to training various videos using machine learning models.

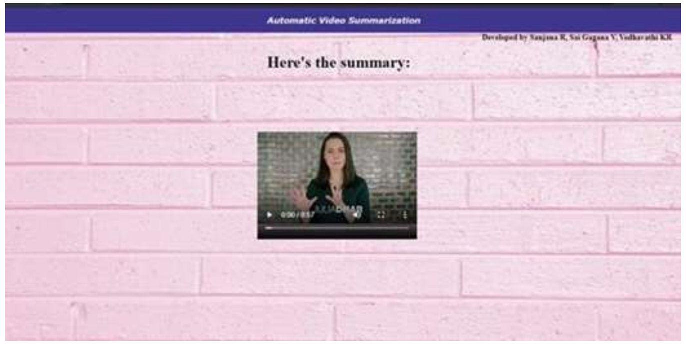


Automatic Video Summarization

Developed by Sanjana R, Sai Gagana V, Vedhavathi KR

Enter the youtube link and Time:

Figure 1: User Input Page



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Here's the summary:

Figure 2: Final Output Page.

EXISTING SYSTEM DISADVANTAGES

- Existing video summarization systems require strong prior technical knowledge.

- Machine learning based algorithms require high processing power.

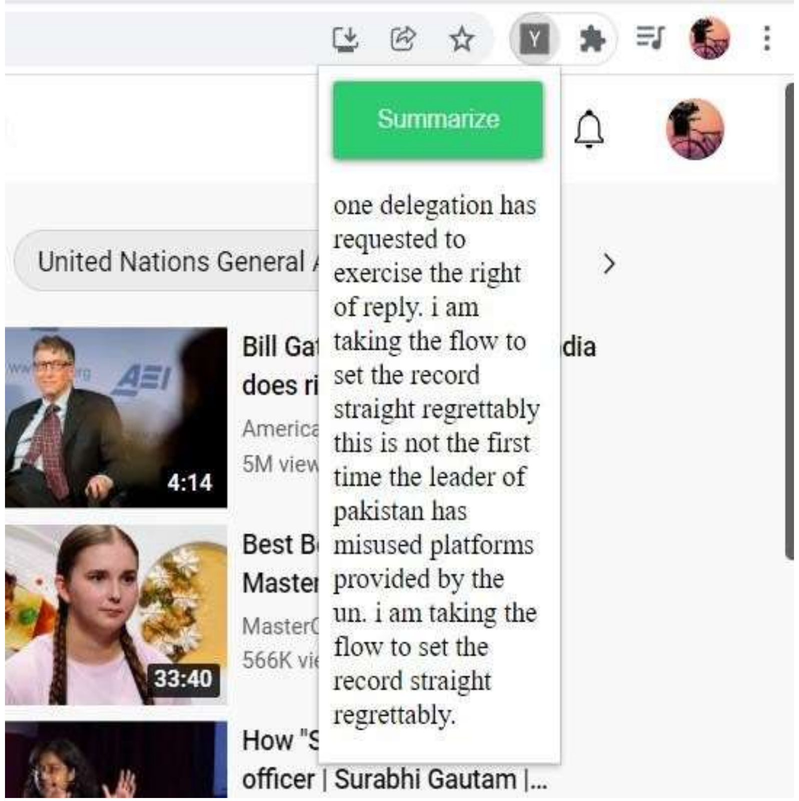
- Content is not brief, to know the important points of the given YouTube video ID

PROPOSED SYSTEM

- The system takes the input YouTube video from the Chrome extension of the Google Chrome browser when the user clicks on the summarize button on the chrome extension web page, and access the transcripts of that video with the help of python API.

- The accessed transcripts are then summarized with the transformers package.

- Then the summarized text is shown to the user in the chrome extension web page.



one delegation has requested to exercise the right of reply. i am taking the flow to set the record straight regrettably this is not the first time the leader of pakistan has misused platforms provided by the un. i am taking the flow to set the record straight regrettably.

PROPOSED SYSTEM ADVANTAGES

- This model produces a completely different text that is shorter than the original, it generates new sentences in a new form.

- Time saving process.

- Looks at the whole content of the project.

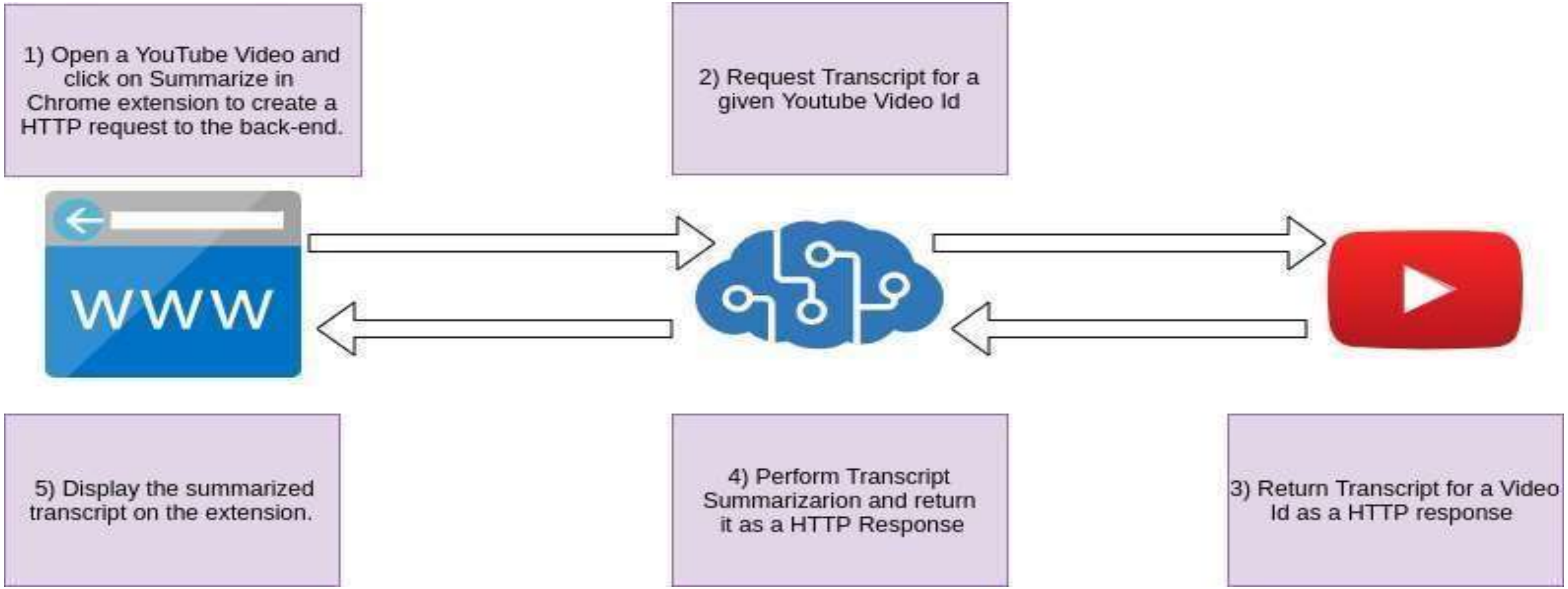
SOFTWARE REQUIREMENTS

- Coding Language : Python
- Back-End : Flask, YouTube_transcript_API, Hugging face transformers.
- Front-End : Chrome extension
- Designing : HTML, CSS, Javascripts.

HARDWARE REQURIMENTS

- System :
- Hard Disk:
- Storage:
- Monitor:

ALGORITHM EXPLANATION



1) Open a YouTube Video and click on Summarize in Chrome extension to create a HTTP request to the back-end.

2) Request Transcript for a given Youtube Video Id

3) Return Transcript for a Video Id as a HTTP response

4) Perform Transcript Summarizarion and return it as a HTTP Response

5) Display the summarized transcript on the extension.

ALGORITHM EXPLANATION

- Step 1: Getting Started with the back-end
- Step 2: Get transcript for a given video
- Step 3: Perform Text Summarization
- Step 4: Create REST API endpoint
- Step 5: Getting Started with Chrome Extension
- Step 6: Build a User Interface for Extension Popup
- Step 7: Display Summarized transcript

Continuation

Text summarization is based on NLP algorithm. It consists of two types as follows:

- **Extractive Summarization:** This is where the model identifies the important sentences and phrases from the original text and only output those.
- **Abstractive Summarization:** The model produces a completely different text that is shorter than the original; it generates new sentences in a new form, just like humans do. Here we’ll use transformers for this approach.

We will use Hugging Face’s transformers library in Python to perform abstractive text summarization on the transcript previously obtained.

MODULE EXPLANATION

1. **Flask :** Flask is a micro web framework written in Python. It is classified as a microframework because it does not require particular tools or libraries. It has no database abstraction layer, form validation, or any other components where pre-existing third-party libraries provide common functions.

   This means flask provides you with tools, libraries and technologies that allow you to build a web application. This web application can be some web pages, a blog, a wiki or go as big as a web-based calendar application or a commercial website.

Continuation

2. Transformer : This means they have been trained on large amounts of raw text in a self-supervised fashion. Self-supervised learning is a type of training in which the objective is automatically computed from the inputs of the model. That means that humans are not needed to label the data!.

□ Transformers provides APIs and tools to easily download and train state-of-the-art pretrained models. Using pretrained models can reduce your compute costs, carbon footprint, and save you the time and resources required to train a model from scratch. These models support common tasks in different modalities, such as:

📝 Natural Language Processing □ Computer Vision

□ Audio 🐙 Multimodal

Continuation

3. **YouTube-transcript-API :**This module is used for getting the captions/subtitles from a YouTube Video. It can be installed using:

pip install youtube-transcript-api # for windows, Linux and MacOs

Before starting with the process we would like to explain how we can get the video id of a YouTube video. For Example, if a YouTube video has the following URL

https://youtu.be/SW14tOda_kI

Then the video id for this video would be “SW14tOda_kI”, i.e. all the phrases after the ?v= counts as the video id. This is unique for each video on YouTube.

THANK YOU