

Multimedia Summarizations Using HITS Algorithm

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ABSTRACT

Video summarization is described as creating a abstracted video clip which includes only the important scenes in the original video streams. Currently video summarizing is human-interacted, the person who is dealing with the raw video should select the highlights of each video and join them to create a series of highlights.

A novel approach is proposed to video summarization using the audio descriptor. This uses the audio descriptor or text information from a provided video, a system will then generate a paragraph of textual information of the video. By summarizing the textual information & accessing the video content related to the summarized output and get the summarized video of the desired length.

This summarization is simple and flexible, which owns rapid generation of a summary of any desired length.

Keywords: HITS Algorithm, summary Generator.

1. INTRODUCTION

Now days, speedy advancement of digital video capture and editing technology led to increase in video data, creating the necessity for effective techniques for video retrieval and analysis. Advances in digital content distribution and digital video has caused digital content recording easy. However, the user may not have enough time to watch the entire video. In this case, the user may just want to view the abstract of the video instead of watching the whole video which gives better information about the occurrence of various incidents in the video.

1.1 Video summarization:

Video summarization is a mechanism for generating a short summary of a video, which is either be a sequence of stationary images i.e. key frames or moving images i.e. video skims. Video can be summarized in this paper by frame based video summarization as follows.

Key Frame Based Video Summarization

These are also called representative frames, R-frames, still-image abstracts or static storyboard, and a set consists of a collection of salient images extracted from the underlying video source. Following are some of the challenges that should be taken care while implementing Key frame based algorithm

1. Redundancy: frames with small difference are selected as key frame.
2. When there are various changes in content , then it is harder to make clustering.

1.2 Entities of projects:

1.2.1 Summary Generator:

Summary generator is responsible to give summary text file which is converted into summary video file.

1.2.2 Summary video generator:

After converting original text file to summary text file. We need to convert it to video.

The summary video generator converts a text file to video file.

1.3 Basic architecture:

In our paper, User gives input as Video file and (.srt) text file (which contains dialogs, start time and end time of video). After receiving input from user summary generator generates a text file which contains only related sentences

together. Finally, Summary video generator converts that summarized text file into video file and summarized video file is pass to system as an output

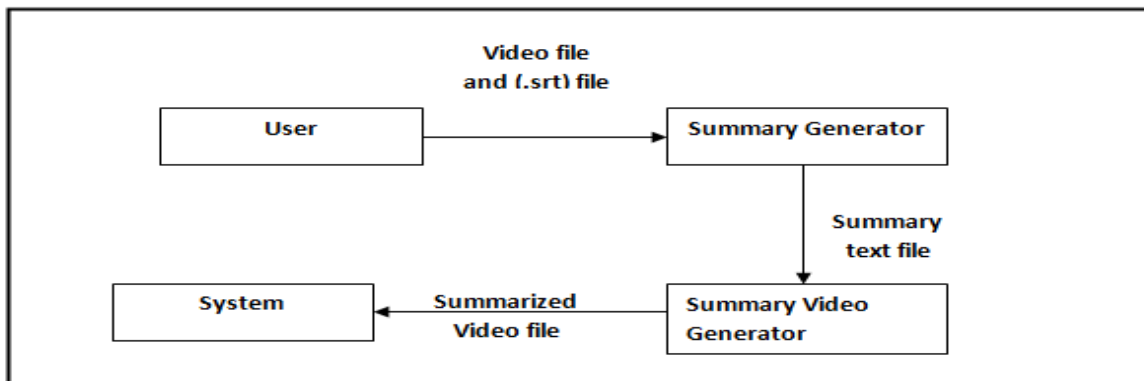


Fig1. System Architecture

2.LITERATURE REVIEW

2.1 Audio Summarization:

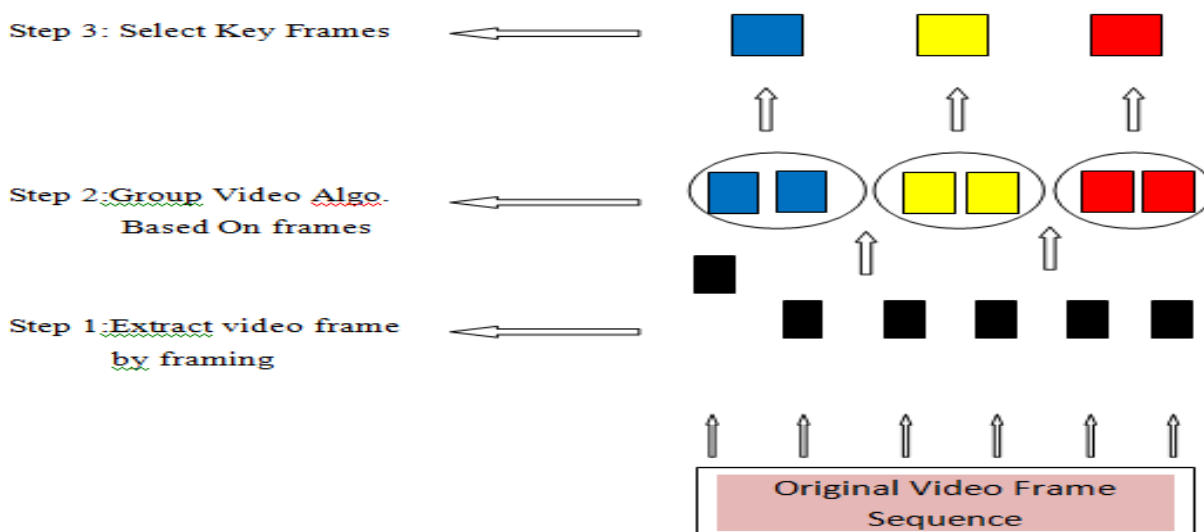
Audio summarization is an ongoing research, which depends either on algorithms to identify and remove the redundancy, for example in music or first turn speech into text, and then apply text summarization methods. The peculiarities and potential ambiguities of decoded audio such as high recognition error rates, lack of syntactic boundaries, etc. need to be addressed specifically for extracting summary information from audio for content-based browsing and skimming.

2.2 Text Summarization

Text summarization is the technique of automatically constructing a compressed version of a given document without losing its information content. Text summarization can be distributed into two approaches: extractive and abstractive. Extractive summarization technique simplify the problem of summarization into the problem of electing a representative subset of the sentences in the original documents.

2.3 Video Summarization

A video summarization is a summary that represents abstract view of original video, can be used as video browsing and retrieval systems. Different methods can be used to choose key frames. Key frames based video summarization works on frames. In the first step ,extract frames from original video frame sequence. In step two, extracted video frames are gather that have redundant content obviating the need for shot detection. Selection of key frames is proceeding in step three. The detail procedure is shown in fig.



3. IMPLEMENTATION

Step I: This is the GUI of Video summarizer. We use different components for the project.

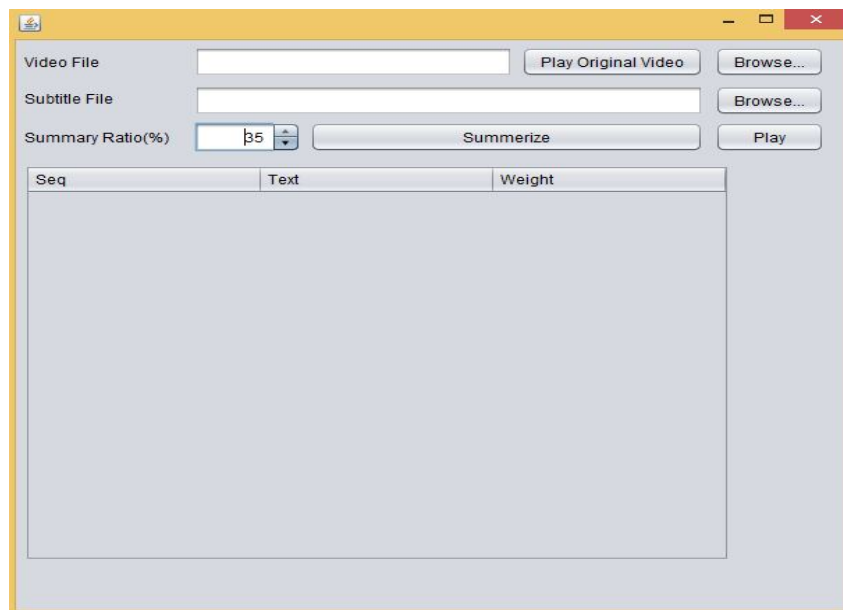


Fig.3: Step I

The components are as follows:

1. Video File: We take input as original video file.
2. Subtitle File: This takes (.srt) file as text file.
3. Summary Ratio: This provides the percentage for video summarizer.
4. Summarize: Generates the output as summarized video file.

This is the sample video (.mkv) and (.srt) file. We set summary ratios 35% i.e. the summary video will be of 35% of original video file.

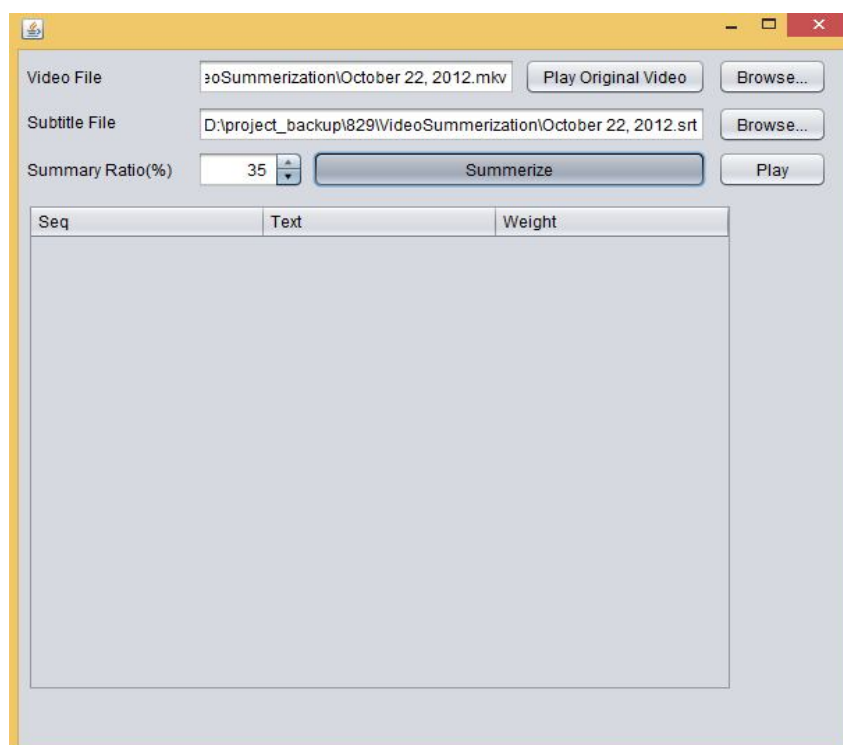


Fig.4: Step II

Once we take input of .mkv and .srt file, it will calculate weight for each sentence.

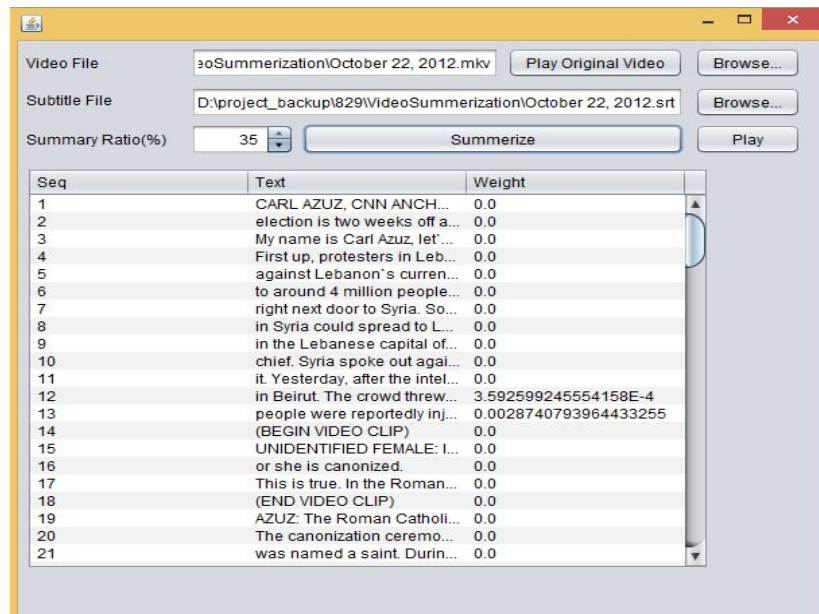


Fig.5: Step III

Finally, it will give output with sequence, text and weight of topmost selected nodes.

ROUGE stands for Recall-Oriented Understudy for Gisting Evaluation. It includes measures to automatically determine the quality of a summary by comparing it to other ideal summaries created by human being. The measures count the number of overlapping units such as n-gram, word sequences and word pairs between the computer-generated summary and the ideal summaries created by humans.

Following are the formulas for the calculation of recall, precision and f-measure in ROUGE N-gram metric:

Recall: Recall means ratios of no. of matched n-grams between test summary and reference summary by no. of n-grams of reference summary.

$$R = \frac{\text{matched ngrams}}{\text{No. of ngrams of reference summary}}$$

Precision: Precision means ratios of no. of matched n-grams between test summary and reference summary by no. of n-grams of test summary.

$$P = \frac{\text{matched ngrams}}{\text{No. of ngrams of test summary}}$$

F-Measure: F-Measure means ratios of recall and precision.

$$F = \frac{(1 * \text{Beta} * \text{Beta}) * P * R}{R + \text{Beta} * \text{Beta} * P}$$

Where, Beta=1.0

The Dragon Toolkit is the Java-based development package for academic use in information retrieval (IR) and text mining.

5. RESULT AND ANALYSIS

Result 1: Oct 22

Table 1. Result of Summarizer

Recall	Precision	F Measure
0.639853747714808	0.7	0.668576886341929
0.663244353182751	0.646	0.654508611955421
0.463617463617464	0.446	0.454638124362895
0.524528301886792	0.556	0.539805825242718
0.584199584199584	0.562	0.572884811416922
0.546906187624751	0.548	0.547452547452548
0.593291404612159	0.566	0.579324462640737
0.530612244897959	0.52	0.525252525252525
0.611881188118812	0.618	0.614925373134328
0.681720430107527	0.634	0.65699481865285

The table shows the result of summaries generated by our Video Summarizer with human-generated summaries for the video CNN Student News of October 22, 2012. Here the human generated summary is taken as reference summary and summary generated by our Video Summarizer is taken as candidate summary. The numerical data shows how automated generated summaries are closer to human-generated summaries with the help of ROUGE-N technique

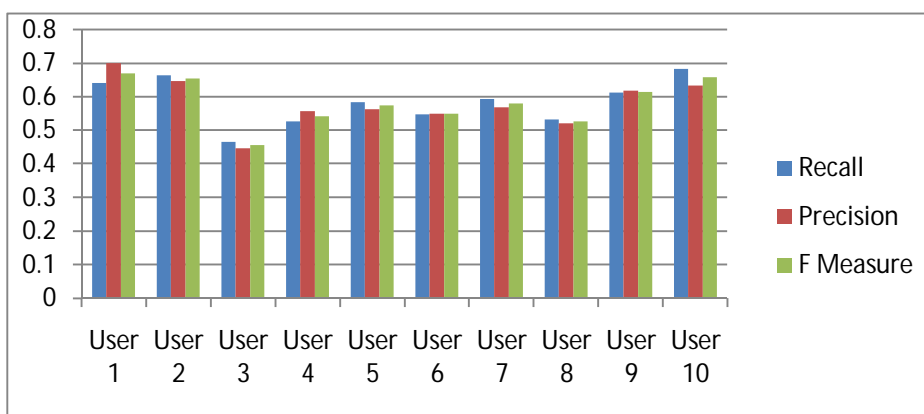


Fig6. Result Graph of Previous Summarizer

6. CONCLUSION AND FUTURE SCOPE

We proposed to show the video summarization using audio descriptor. In our application, we are presenting such a technique which gives summarized data for given video. We will differentiate our work from existing systems in that we are analyzing static summaries with a multimedia component, i.e. ones that can be viewed all at a time instead than see the video from start to the end. We will also show that a summarized data can be produced in such a way that a user can get the idea about the video without watching that full video.

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