CONTENT BASED VIDEO SEGMENTATION

Berk Can ÖZÜTEMİZ– Ece NALÇACI– Veli Engin ÖZTÜRK
Prof. Dr. Erdoğan DOĞDU
Çankaya University, Department of Computer Engineering

Abstract

A video is a sequence of images named frames. Our project aims to divide a video into segments (shots) wherein the scene or camera position does not change significantly and our project will consider both visual and semantic contents of the frames. The frames are shot in a very short time interval from each other. Therefore, the consecutive frames are very similar in content. However, with changes in scene, story, etc. the frame contents may change very quickly. For instance, a video may start with an indoor scene, and then it may switch to some outdoor scene. The first step in video indexing is video segmentation into shots where each shot is manually or automatically segmented.
Keywords: video, frame, shot

Solution

Our project aims to divide a video into segments (shots) wherein the scene or camera position does not change significantly. There are six groups of approaches for temporal video segmentation in compressed domain based on the information used .

	Group					
Information Used	[29]	[30]	[31]	[32]	[33]	[34]
DCT coefficients	✓			✓		
DC terms		✓	✓			
MB coding mode			✓	✓	✓	✓
MVs			✓	✓	✓	
Bit-rate						✓

Figure 2 – Approaches for Temporal Video Segmentation

The frames on the video are encoded as IPPPP structure. I frame is referenced as base frame, according to changes in DC term and motion vectors on P frame; the change in the scene is indicated and cut into meaningful shots.

Introduction

With the advancement in technology, multimedia is being widely used. Multimedia is the field concerned with the computer-controlled integration of text, graphics, drawings, still and moving images, animation, audio, and any other media where every type of information can be represented, stored, transmitted and processed digitally. Multimedia Computing is becoming more important every day because of the rapid growth of data. Most of the multimedia data such as videos, stored in compressed form. Video compression is that a video may be considered as a stream of frames taken consecutively at very short intervals and is viewed and understood by some end user. Many video codec industry standards and so many proprietary algorithms are available to make it practical to store and transmit video in digital form. Due to the growth in multimedia information, an effective video indexing and video retrieval is necessary. Video segmentation is a way of dividing a video into meaningful segments. This can be achieved when effective video segmentation tools and algorithms are available. MPEG-compressed videos are mostly used for video segmentation.

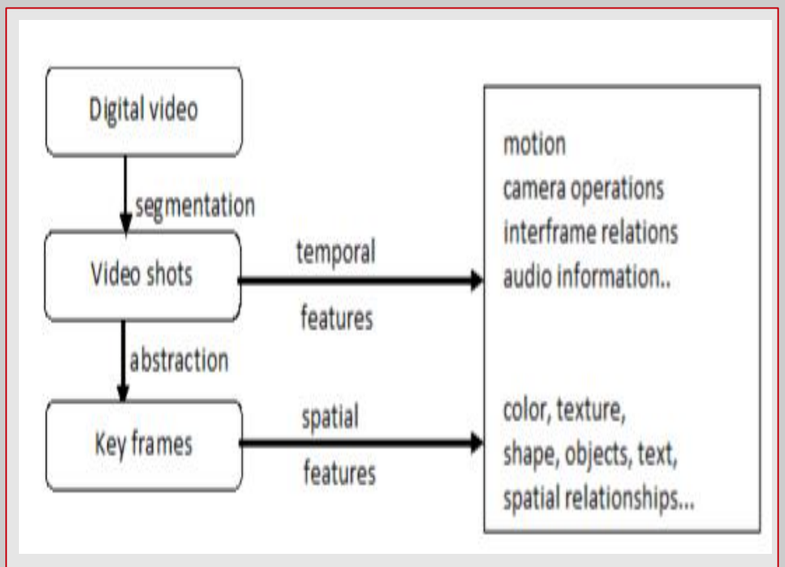

Figure 3 – Content-based retrieval of video databases

Figure 4 – Finished Product

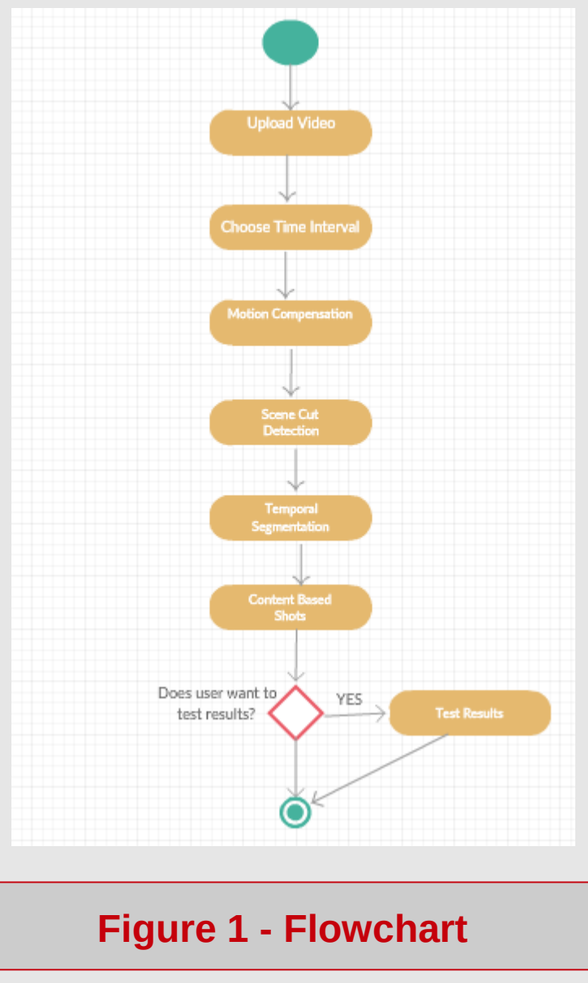

Figure 1 - Flowchart

Results & Conclusion

Video segmentation can be used in many applications. Content selection allows time and space to be reduce, during the retrieval process. Some of the advantages of Content based video segmentation can be considered as summarizing a sport event, skimming a video and mining the patterns of a video. In addition, video surveillance can be done with content based video segmentation where the segmentation result can be used to identify a pattern. Content based video segmentation is also used in videoconferencing, it helps to achieve a better quality by coding the most relevant objects at higher quality.

Acknowledgement

We are grateful for guidance we have received from Prof. Dr. Erdoğan DOĞDU and Assist. Prof. Dr. Roya CHOUPANI. The help we received from them was a great asset to improve this project and ourselves.

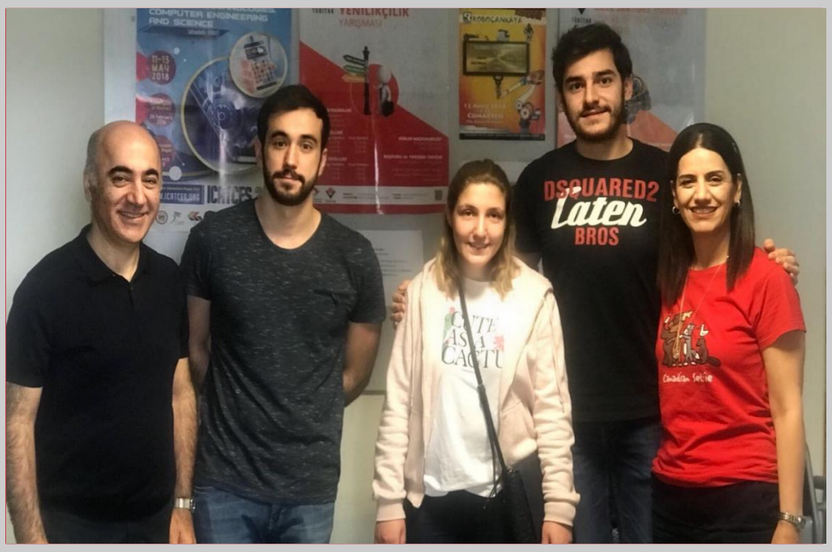

Figure 3 – Team