ADEPT IDENTIFICATION OF SIMILAR VIDEOS FOR WEB-BASED VIDEO SEARCH

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Abstract— Adept identification of similar videos is an important and consequential issue in content-based video retrieval. Video search is done based on keywords and mapped to the tags associated to each video, which does not produce expected results. So we propose a video based summarization to improve the video browsing process with more relevant search results from large database. In our method, a stable visual dictionary is built by clustering videos based on the rate of disturbance caused in the pixellize, by the object. An efficient two-layered index strategy with background texture classification followed by disturbance rate disposition is made as core mapping methodology.

Key terms – Video summarization, Pixellize, Two-layered indexing, Mapping.

1. INTRODUCTION

Currently videos do cover a large part of data on the online server. Videos have become one of the most important base for information and it is widely improving its range of use in the teaching field. More than all this they provide great reach for people who expect online entertainment. We have large number of websites dedicated especially for browsing and viewing videos. We type in keywords and retrieve videos, as simple as that. But not much importance is given to criteria „relevancy” when videos are considered. Since videos are of great entertainment values, they will reach almost all age group people who are online. In such case, relevancy and faster retrieval becomes a major need which has been ignored till now.

In all the video oriented websites, the searching is based on the keywords which we type in. Using the keywords, the engine will search for all the matching tags available in the videos. Each video will have many tags associated to it. Here tags refer to the concept on which the video is based on. Definitely a video will contain a minimum of five tags. Most of the websites allow the user who uploads the video to specify their own tags. So the tags are completely independent of the website’s vision. In other websites, the words in the name of the video specified by the user will be used as the tag words. Here neither of the methods deal with the actual content of the video but just takes words as filtering criteria for a video base search.

Thus existing system shows the following flaws are 1. Browsing time is very high, since the results produced are vast. 2. Results are not relevant. Since the tag words may be generic, the database search is lengthy and time consuming.

3. There is no filtering of redundant videos.

Thus here we propose a better method of filtration with help of content based video retrieval. Here we take into account the actual content of the video and not any words which are provided by the user over it.

2. RELATED WORK

There many works related to our proposal which have adopted a similar objective with a different perspective. The initiation started way back in 2002, when video was getting more attention from the online user. But that time they were only able to propose a theoretical procedure for structure analysis of the images of the video for better filtration and retrieval [4]. But that proposal failed to explain the practical implementation of it.

Later to overcome the difficulty of variation of in the dimension between the videos, a proposal came over to match low with high dimensional videos over comparing which did a contribution to video comparison factor [7]. With all the advancements, came up the new idea of feature extraction for comparison of videos in content matter with help of video signature [6]. Even though this notion gave good similarity results, it is not practical to implement it in a busy network like internet because of its high complexity and time consuming factor. Since time matters, indexing was simplified with the help of vector based mapping which uses slicing the videos [8] and using pointers, which performed great solely. Later dynamic binary tree generation [9] came into being to avoid storage
problems which saved storage space but consumed time.

A very similar proposal to ours but complicated in its implementation came up which uses threshold and color histogram [10] to do content based analysis which has large complexity which we have resolved. Later came up a completely dedicated searching and retrieval method for MPEG-7 [5] which is not much use now days. Personalized video searching with reusability depending on user came up with high caches [3] which can be used for private use but not much for a public explosion. When queries become difficult to express, a proposal came up to implement a application based technology combined with multi-touch exploitation which would result in compelling the user to give entry to an external application inside their browser [2].

Finally, the base of our proposal was from a content based retrieval idea [1] which uses a complex B+ tree method to retrieve videos using symbolization, which is feasible except for its complexity. Here we try to have the complexity level at minimum with high responsive and relevant videos with limited time consumption.

3. SYSTEM DISCRIPTION

We propose an efficient CBVR (Content based video retrieval), for identifying and retrieving similar videos from very large video database. Here searching is based on the input given as a video clip rather than caption.

We store the video in an efficient manner so that retrieving is easier and more relevant. This is mapped by two-level indexing, first segregated on basis of background texture, followed by object pixellize disturbance.

There are three major modules which defines the proposed system as the figure (1) shows. Here the first module of key frame generation is the major part. Where the videos are divided into the multiple images as keyframes. Then we are going to trace the actual background of the video. Then the background key frame is used as the first level of filtration done in the database.

Then the second module includes mapping in database which is done by two level of mapping techniques called background comparison shown in figure(3) and the object identification which is done by comparing the rate of disturbances caused by the pixels as shown in figure(4).

We further develop a number of query optimization methods, including effective query video summarization and frame sequence filtering strategies, to enhance the search. We have conducted an exclusive performance study over large video database. This background keyframe filtering method tends to produce an unstable visual dictionary of large size, which is desirable for fast video retrieval.

Then we Sequentially scan all the summaries to identify similar videos from a large database which is clearly undesirable. But the efficient indexing video summaries are necessary to avoid unnecessary space access and costs. So we propose most effective two layered mapping in which it reduces the browsing time and retrieves more relevant videos on a large database. Some of the Advantages of proposed systems are Effective processing on large video database. Retrieval of more relevant content of video. To save the time for checking the whole video to know the contents. Mitigate the computational and storage cost by reducing redundancy.

4. IMPLEMENTATION

The proposed idea can be implemented in system using the following modules.

4.1 KEYFRAME GENERATION

Major module which includes the key frame generation. Initial steps include the following:

=>Break up the video into multiple images.
Map out the background key frame.
Plot the position of the object in the video, by sorting out the disturbance.

4.1.1 BACKGROUND KEYFRAME GENERATION

Here we are going to trace the actual background of the video. This background key frame is used in the first level of filtration done in the database. We apply the following step to trace the background of a video.

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i. Initially the video is converted into multiple frames of pictures.
ii. Now number each frame $N_i, N_i+1, ..., N_n$
iii. Compare pixel(k) $N_i[k] = N_i+1[k]$
iv. If they are same update store them in key frame(kf[i][k])
v. Key frame may result in more than one, if the video has highly different backgrounds.
vi. Again continue the same with kf[i] to produce a single background key frame.
vii. Some pixels may not be filled, they can be computed from the surrounding pixels.

4.1.2 OBJECT POSITION IDENTIFICATION

ALGORITHM

i. Now we have kf[i] which shows the key frame of the video segment which has same background.
ii. Compare the pixel(k) kf[i][k] with the same pixel middle frame from that video segment.
iii. Fill the object key frame pixels with black when they match.
iv. Only few pixels won’t match.
v. That position will be filled with the color of the selected frame’s corresponding pixel.

4.2 MAPPING IN DATABASE

Database mapping are typically implemented by manipulating object comparison to retrieve relevant search videos. It includes the two level of filtering used to find relevant videos in the database. Given a query video, First the background of each keyframe are mapped by looking up the visual dictionary in which the related videos has been stored. Then, the video segments (frames) containing these backgrounds are retrieved, so the potentially similar video results are displayed according to their matching rate.

Second is by identifying the object position which compares the pixels of two keyframes, we assume that they are matched if they are similar, and unmatched otherwise. However, since the neighboring clusters in multidimensional space may be overlapped with each other, two similar subdescriptors falling into the overlapping part of clusters may be represented as different pixel matching, thus, misjudged or misplaced as dissimilar ones. These dissimilar ones are considered to be the disturbance rate called the objects.

Accordingly, the matched keyframes to the pixels containing overlapping frames may be
considered as unmatched, which degrades the accuracy of pixel sequence matching. Therefore, the unmatched pixels are considered to be the rate of disturbance called the error rate. With this error rate we can retrieve the second level of filtration that is object identification. As a result, retrieval will be easier and effective by our two layered filtration as shown in fig (5 and 6).

4.3 RETRIEVING RELEVANT VIDEOS

To retrieve similar videos more efficiently and effectively, several key issues need to be noted. First, a video is required to be represented compactly and informatively. This issue is important, as a video typically contains a number of keyframes, and the similarity between two videos is usually measured by finding the closest match or minimum error rate for every single keyframe of them. Thus, searching in large databases over a raw video data is computationally expensive. The second issue is how to measure the similarity between videos based on their pixel matching rate. To overcome this, we used the most effective and efficient two layered filtration, first is background keyframe generation and object identification.

Therefore, the user can select any retrieved videos and playback the video clip. Figure 7 shows one of the sample example of retrieval result. The retrieval results will be even better when the backgrounds are masked out. On the other hand, if the background becomes much clumsy or its area increases, the results will degrade gradually.

But the current video search engines are based on lexicons of semantic concepts and perform tag based queries. These systems are generally desktop applications or have simple web interfaces that show the results of the query as a ranked list of keyframes. For each result of the query it is shown the first or similar frames of the video clip. These frames are obtained from the video streaming database, and are shown within a small video player. Users can then play the video sequence and, if interested, zoom in each result displaying it in a larger player that shows more details on the video player and allows better video detection. The extended video player also allows to search for visually similar video clips.

Therefore at the bottom of the result lists there are the concepts which are related to the video results. By selecting one or more of these concepts, the video clips returned are filtered in order to improve the information retrieval process. The user can select any video element from the results list and play it as they needed. This action can be repeated for other videos, returned by the same or other queries. Videos, out of the list can be moved along the screen, resized or played. Therefore the overall retrieval process is simple and effective which gives the results faster.
5. CONCLUSION

In this paper, we discussed our proposal for all video search engines and their related issues. It extracts various video metadata from a video query themselves on a large database and displays the most relevant videos on the webpage. Then our paper also deals with the identification and extraction of keyframes and pixelate matching followed by the video retrieval. Then, we presented an effective disturbance rate disposition, to measure the similarity between two video clips by taking into account the visual features and sequence contexts of them. Finally, we introduced a two tier indexing scheme, which outperforms the existing solutions in terms of efficiency and effectiveness.

6. REFERENCES


