Feature Extraction by Surf Technique used for Content Based Video Retrieval

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Abstract: *Content Based information retrieval is an active area of research these days. The growth of multimedia data is increasing day by day. So, there is great need to make advancements in this area. we are discussing about the content based video retrieval as well as new advancements in this area. If the video sequences are stored based on contents like color, texture, or events, then the video mining may be speed up to a great extent. So, we have tried to present a novel method which will be very efficient to work on large video database and the multiple contents of video will lead to accurate result for retrieving the videos in a faster manner thus avoiding the need of extensive human efforts, making some lives easier.*

Keywords: *Feature Extraction, Video Indexing, Video Retrieval, Content Based Video Retrieval, Surf Technique*

I. Introduction

The amount of information is developing once a day. This development of the information is exponential in nature. People are the makers of information like, GPS co-ordinates, instant messages, pictures caught and so on. Because of this gigantic development in information, it is important to store this information at secure spot, and it ought to most likely reestablish easily. Video information is moderately another type of information, which is rising a direct result of the CCTV's, access to top of the line telephones with cameras. These recordings are recollections and critical type of information that will consume more room to be put away. Recordings ought to be reestablished by the substance in the video. The recordings would then be able to be separated, and a great deal of calculation should be possible on the recordings

With the expanding measure of information in the video designs it is expected to create frameworks to portion, file, and store these recordings. The time required to recover the recordings physically, is high. The individual should observe every one of the recordings cautiously and physically separate them as indicated by their substance and significance. The individual should be mindful for quite a while, which opens the window for human mistake. The human may have predispositions, and thus there would be no positive evidences. To diminish the time required for this procedure and instigate some feeling of dependability we have to build up a framework which is quick, exact, and doesn't rely upon the people collaborating with the system[1].

The information in the video design isn't just hard to store as it takes significantly more space than the other sort of information, yet to channel and recover recordings as per the information takes a great deal of time and human exertion. It takes hours or here and there even days to observe every one of the recordings and endeavor to see if the substance the people needed to discover in the video is accessible or not. People likewise will invest a great deal of energy watching recordings that never had the substance they needed to discover. Henceforth, there is an exigency to build up a framework that will recover recordings as per the substance, in the recordings.

The stage at present accessible, are not sufficiently hearty, a great deal of research has gone into substance based picture recovery and there are frameworks accessible for the equivalent. However, the need of great importance, requests a framework that will store broad database of recordings, yet additionally locate the required video from these pool of recordings.

CBVR is a framework which is created to recover pictures as indicated by their substance. Picture preparing and PC vision procedures used to recover the recordings. It is normal that, by all the while utilizing the calculations from the previously mentioned procedures will prompt a framework that will most likely recover recordings, in view of the info content gave to them. The objective is to discover whether the picture question given by the client is accessible in the database made. Vital parameters will be extricated, from the recordings in the database and put away diversely and after that, the parameters from the info picture will be separated and coordinated to see whether the information exists in the broad database. Therefore diminishing the human exertion and time, and making the procedure dependable, and faster[2][3][4].

II. Basic Theory

This research aims to create a content based video retrieval system which will use concept of Image processing and some concepts of Computer Vision to retrieve videos from an extensive database. This system intends to combine both Surf Technique and Euclidean method for the final output[6]. To do so we are going to convert the videos to .avi format. Edges of the key frames of videos in the database will be stored differently. These key frames will be compared against the input frame to provide a binary output. Though a lot of research has been done in the content based image retrieval, take it a step forward by making a system for videos, which will result into an efficient and effective system to use reducing the human time and effort[5].

1. The objective of the research is to create a system that the humans can rely on and not waste time on repetitive tasks, thus, giving humans more time on tasks and decisions that require more logical reasoning.
2. The parameters used for the filtering process are based solely on the content. Algorithms designed exhaustively for the purposes of retrieval based on edge detection are going to be used.
3. Mathematical computations and storage of quality data in form of matrix, will reduce the time.

Final result will be a MatLab built software application, with a video database, that utilized texture and colour features of the video in the database as the basis of comparison and retrieval, thus giving the authorities using this system a superiority over the people not using this software. Fig 1.1 shows basic working of CBVR system
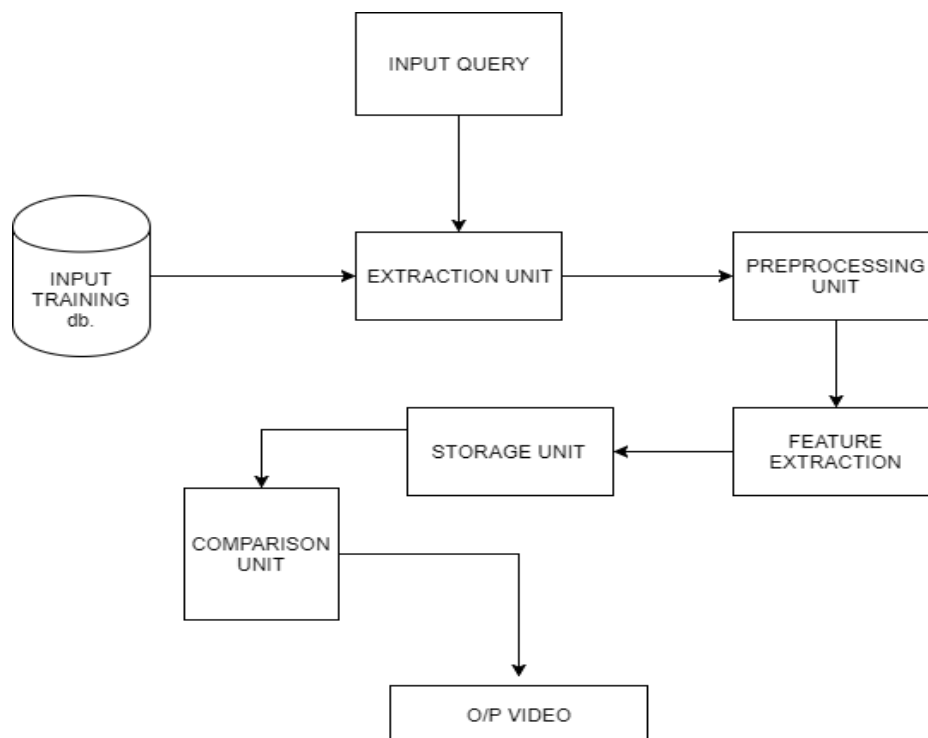

Fig 1.1 Basic Working of CBVR System

Input query

The input is provided to this module in the form of an image. This is the user input, ie, the content of this image is what the user wants to find in the videos present in the database. This is the only input that the user has to enter in order to check, for the videos in database.

Video database

This is the set of videos that are provided to the system. All the input queries will be matched against this database, to check whether the content of the input image is present in or not.

Extraction unit

As to match the content. It is not feasible to compare to videos, directly, and hence, keyframes are selected and extracted from the video, and are stored, which are mapped to the video they were extracted from, while storing differently.

Preprocessing unit

Once the frames are extracted we cannot directly store it. we have to preprocess those frames before storing them in the database. so in this step segmentation of videos will take place. the video will be divided into shots and the selected keyframe will go under preliminary mathematical computation to make the frame ready for feature extraction.

Feature extraction

We are going to use algorithms to extract features to identify key frames and store them in mathematical form, which will be stored, in the storage unit. All the videos in the video database have gone through this procedure, and the input query will feature will be matched against the database to check.

Storage unit

Pixel values of images are stored in database for further comparison.

Output video

The input query clip is compared with that of the stored database clips using a minimum distance algorithm. Based on the output similar videos in the library are ranked and retrieved accordingly.

III. Proposed System

This system will find its application in a variety of domains. Anyone using this system can put the videos in the database. The system will store the edges and extract the important parameters and store it in a different table, which is going to be mapped with the videos they are linked with. The extracted data will be then compared to the input image query which will be converted to the same format as above. Algorithms for matching are used, to determine whether the image query is present in the database or not. The output will be binary, if the video is present where the image query is found then the video will be listed. The proposed system is going to use core algorithms from the domains of image processing and computer vision, for better and faster performance [6] [7] [8].

IV. Results

The proposed system has implemented retrieval system by integrating various features of query video frame. Experimental results show that integration of extracted features improves video indexing and retrieval. This is demonstrated by the finding that multiple features produce effective and efficient system. There can be large area of application of proposed system like criminal database retrieval, biomedical information, etc. We further intend to enhance system by integrating more features and other methods and can be extended further to retrieval also from social websites as shown in fig.1.2.

Fig 1.2 Feature Extraction Techniques for CBVR System[9][10]

V. Conclusion

Video Retrieval is broad area that integrates features from several features and fields including artificial intelligence, machine learning, data base management systems, etc. There have been large numbers of algorithms rooted in these fields to perform various video retrieval tasks. This proposed theory has implemented retrieval system by integrating various features of query video frame. This is efficient and effective, which will make life easier and faster.

The expected output of the system is binary, that is whether the video is present in the database or not, and if the video is present in the database, then all the videos will be listed down. The user will be able to apply some basic filters. Also statistics on the performance of the system will be provided. Thus making, this process easier,

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