CONCEPT BASED VIDEO RETRIEVAL

Varsharani Babar 1 , Shivanee Bhor 2 , Krupa Kamble 3 ,Ms Arathi Kamble.

[1, 2, 3]Student

[1, 2, 3]Department of Computer Engineering

[1, 2, 3]NHITM, Thane, India

***Abstract*— Digital video now plays an important role in security. Several content-based video retrieval (CBVR) systems have been proposed in the past, but they still suffer from the following challenging problems: (a) Semantic gap; (b) Semantic video concept modeling; (c) Semantic video classification; (d) Concept-oriented video database indexing and access. In this project, we propose a novel framework to make some advances towards the final goal to solve these problems. The amount of information must be followed by the development of the effective Information Retrieval System (IRS) so that the information will be easily accessible and useful for the user. This study reviews the evolution of IRS, regress from image-based to concept-based. Concept-based video retrieval has been considered as a feasible alternative technique for video search. In order to retrieve a desirable video shot, a query should be defined based on user's needs so that the user gets only relevant output. This paper describes an application where user gives an image & a video as an input. The video is divided into unique key frames and the frames containing the object in the image will be extracted and the output will be the video of the extracted frames. Therefore the user won't have to watch the complete video, and can just watch the frames containing the object of interest. Here we are using CBVR, SURF, SHIFT, XUGGLE techniques and the front end is JAVA and back end is MYSQL respectively. The programming language which is used in this project is JAVA.**

Keywords- Concept Retrieval, Search Video, CBVR (Content based video retrieval), Feature extraction, Indexing Framework.

I. INTRODUCTION

Semantic indexing and retrieval for video databases has been a very active research field over the past few years. The global goal is to automatically describe the videos, then to index them by their contents. Nevertheless, retrieving relevant samples and easily navigating within large collection are still very difficult tasks. The source of Information contains various media format, beside text there is also image and video that is called multimedia. Multimedia Information Retrieval System (MIRS) is one of the most challenging and novel issues. Search for knowledge in the form of video is the main focus of this study. In recent years, there has been a tremendous need to query and process large amount of data that cannot be easily described such as video data. There is a need of information in any kind of media, not only retrieve the document in text format, but also retrieve the document in an image and video format at once from any kind media format of the query. [1]

There are two phases: content-based and concept- based. Each phase takes on indexing system and retrieval techniques to optimize information retrieved.

1. Content based video retrieval.
2. Concept based video retrieval.

1.1 Content based video retrieval

Content-based video retrieval (CBVR) systems analyze visual video content and generate appropriate data required to summarize and retrieve content from large video databases. Content-based Video Retrieval (CBVR) was most complicated MIRS if we compare with CBIR, too many components of this system, but research in this field wide open. This system can deal with high dimension and visual feature problems. One of the machine learning algorithm, Support Vector Machine (SVM) Classification was used CBVR to create effective video retrieval, but the result of evaluation was low accuracy and precision. [2]

1.2 Concept based video retrieval

Concept-based Video Retrieval is one of the video search techniques that automatically detected concept. Like Content based video retrieval applies same technique, but still need an addition in motion features in concept based video retrieval. Research about Concept-based Video Retrieval utilizes unified 12 kinds of feature to reduce its computational complexity. The concept co-occurrence matrix and several assistant methods (B&W detection and motion detection) are suggested to enhance the performance of the video retrieval system. Concept based video retrieval has been considered as a feasible alternative technique for video search. In order to retrieve a desirable video shot, a query should be defined based on users' needs. In spite of the fact that query can be on object, motion, texture, color and so on, queries which are expressed in terms of semantic concepts are more intuitive and realistic for end users.[2]

II. REVIEW OF LITERATURE

The basic multimedia information is required for dynamic video indexing and retrieval. There are necessary components for storing, sorting and accessing multimedia contents. They also help in finding the desired components to form a multimedia repository with an ease. Besides many multimedia resources video is a key component which comprises mainly upon three major parts. The first one is that the vigorous video provides rich contents then that of images. The second is an enormous quantity of raw data. Lastly, the structure of video is very minute. These features have made the retrieval and indexing of video relatively complex. [3]

In recent times, the database is getting enormous, the content-

based retrieval and indexing are needed with less human interaction to analyze videos automatically.

Previously, database video was diminutive, along with that the retrieval and indexing were also based on manual keyword annotation. In recent times, the database is getting enormous, the content-based retrieval and indexing are needed with less human interaction to analyze videos automatically.

In the year 2016, a system for Concept-based Multimedia Information Retrieval System using Ontology Search in Cultural Heritage was implemented. This was complex to retrieve as the Ontology-based Semantic similarity measure the semantic relationship between a documents based on the likeness of their meaning. [1]

In the year 2017, a system for Concept-based Video Retrieval Model Based on the Combination of Semantic Similarity Measures was implemented. The drawback here was that the system was only working on the semantic similarities. [3]

III. IMPLEMENTATION

PROPOSED SYSTEM

System architecture is a conceptual model that defines the structure, behavior and more views of a system. The proposed system architecture of our paper, as shown in fig 1 comprises of system components that will work together to implement the overall system

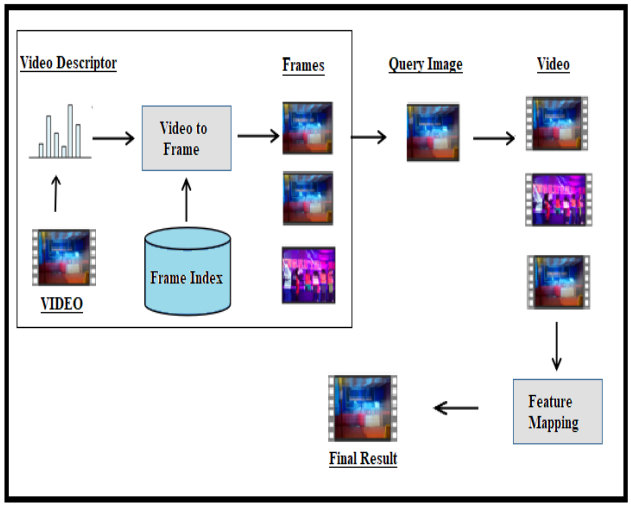

Fig 1: Proposed System Architecture

In this paper we are making an application where user can upload a video and an image, after uploading the video it is divided into unique key frames and these frames are stored in the database. It than searches an image as an input therefore the given input is searched in the database, it would than compare with the existing key frames which in result would display only relevant data. Fig 1 states the block diagram of a large-scale system which searches video databases using data queries. A query video is represented as a descriptor, which can be queried against the index of database – to retrieve a short-list of video clips.

ALGORITHM

1. **SURF:**

The Surf (Speeded up robust features) is a local feature detector and descriptor. It is used for object recognition, image registration, classification, etc.

2. **SIFT:**

The SIFT (Scale Invariant Feature Transform) is a Distinctive Image Features from Scale-Invariant Key points, which extract key points and compute its descriptors.

3. **XUGGLE:**

The XUGGLE converts the video into frames.

IV. RESULT AND DISCUSSION

For computation random video is selected. The size of video is 9.8MB. The duration of these video is about 15 seconds. From the training set consisting of the given number of test clips are constructed. The test set consists of 1 random clips belonging to a group. The query clips contains relevant and irrelevant videos. Thus the system is tested using clips belonging to both training set and test set. Initially 155 frames are extracted using library and later they are further extracted into 92 frames. Using function fps (frame per second) we can calculate per second number of frames, here it is 15. Next key frame can be extracted using threshold comparison. Key frame are frame which represent the consecutive frames with no or minor changes. The Content based video retrieval was time consuming and it could not identify the object in the video while compared to the concept based video retrieval.

V. APPLICATION

SECURITY PURPOSE:

Suppose a person is to be tracked in a given security footage, the application can be used to separate the frames involving that person and hence it saves the time.

VI. CONCLUSION

The paper concludes that the video is being partitioned into frames and then the object that was being searched has been detected upto 60-80 percentage accuracy. The video length can also be given upto 2MB. It supports only MP4 videos. In future the other type of videos can also be processed. The image needs to have atleast 70-80 percent accuracy to extract the frames. The search image and video need to have a good clarity and the pixel quality has to be 576 *1080 approximately. This paper concludes that the accuracy of the output is 80-100 percent as only relevant data is extracted from the given frames. The project can be further improvised by searching for the images containing more than one object.

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