VIDEO BASED QUERY PROCESSING USING A GRAPH TRANSFORMATION AND MATCHING SOLUTION

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ABSTRACT

Video resemblance checking is the most time-consuming and cost-effective operation if you have a huge database. As the demand for visual information of rich material develops, effective and rapid manipulations of large video datasets are becoming increasingly desirable. There have been numerous experiments on content-based video retrieval. Despite its utility, video subsequence identification, which entails locating information in a long video sequence that is comparable to a brief query clip, has gotten little attention. This paper provides a graph transformation and matching solution to this problem, with the purpose of detecting potential changes in ordering. The mapping relationship between the query and database video is initially represented by a bipartite graph, which is then used to locate similar frames using a novel batch query approach. Using a Boolean search, the closely matching chunks of the long sequence are then retrieved, and certain irrelevant subsequences are pruned. Maximum Size Matching reduces the amount of candidates by generating subgraphs from the query and candidate subsequences during the filtering stage. Using a complete video similarity model that takes into consideration visual content, temporal order, and frame alignment information, Sub-Maximum Similarity Matching is employed during the refinement process to determine the subsequence with the highest aggregate score among all candidates.

I. INTRODUCTION

The primary distinction between video retrieval and video subsequence identification is that, while retrieval tasks typically return similar clips from a large collection of videos that have been chopped up into similar lengths or cut at content boundaries, subsequence identification tasks aim to determine whether there is any subsequence of a long database video that shares similar content to a query clip. Because the border and even the length of the target subsequence are not known at the start, it is not possible to choose which fragments to compare.

As a result, the majority of existing approaches for retrieving video clip collections are inapplicable to this more complex challenge. The research on content-based copy detection is focused on a specific problem of detecting co-derivative video. When compared to other approaches, our approach has the following advantages:

In contrast to the fast sequential search scheme that uses temporal pruning to speed up the search process and assumes that the query and target subsequences are strictly of the same ordering and length, our approach uses spatial pruning to avoid comparing all of the feature vectors in the database. The presegmentation of video required by proposals based on shot boundary detection is not part of our approach. Shot resolution is frequently too coarse to correctly pinpoint a subsequence border, which might be a few seconds long.

Meanwhile, our frame sub sampling-based technique is capable of detecting video information with uncertain shot boundaries (such as dynamic commercial, TV programme lead-in and lead-out subsequences). Our comprehensive methodology for analysing video similarity is based on more than just the proportion of identical frames (which overlooks the temporal aspect of films).

Figure 1. Visually similar videos, but not copies. (a) Inserting different sales and local contact information. (b) Modifying some content, and rearranging partial order.

II. RELATED WORKS

For video similarity measurement, we presented the video signature (ViSig) method, which is a randomised technique. We address the remaining two difficulties in this study by introducing a feature extraction strategy for quick similarity search and a clustering algorithm for cluster identification. The ViSig approach, like many other content-based methods, represents video with high-dimensional feature vectors. We offer a unique nonlinear feature extraction approach on arbitrary metric spaces that combines the triangle inequality with the standard Principal

Component Analysis to guarantee a quick reaction time for similarity searches on high-dimensional vectors (PCA).

We show how to use an efficient indexing method to find 1-dimensional subsequences inside a collection of sequences that match a particular (query) pattern within a set tolerance. In feature space, each data sequence is mapped into a limited group of multidimensional rectangles. Then, using classic spatial access methods like the R*-tree [9], these rectangles may be easily indexed.

Image matching has been used in traditional content-based copy detection systems. This research compares the performance of two novel sequence-matching approaches for copy detection with one of the existing strategies. In the context of copy detection, motion, intensity, and color-based signatures are compared. The results of detecting duplicates of movie clips are presented.

III. PROPOSED SYSTEM

Visually equivalent videos may have different orderings in practise due to content modification, resulting in some intrinsic cross mappings.

Our video similarity model, which elegantly finds a balance between discarding temporal order and strictly sticking to temporal order, is especially well adapted to dealing with this issue and may thereby simplify reliable identification. Despite the fact that we only employed the colour element in our research, the suggested method automatically accommodates other factors.

Each frame is commonly represented by a high-dimensional vector abstracted from certain low-level content elements inside the original media domain, such as colour distribution, texture pattern, or shape structure, in a video sequence. Videos are treated as if they were a "bag" of frames to be handled.

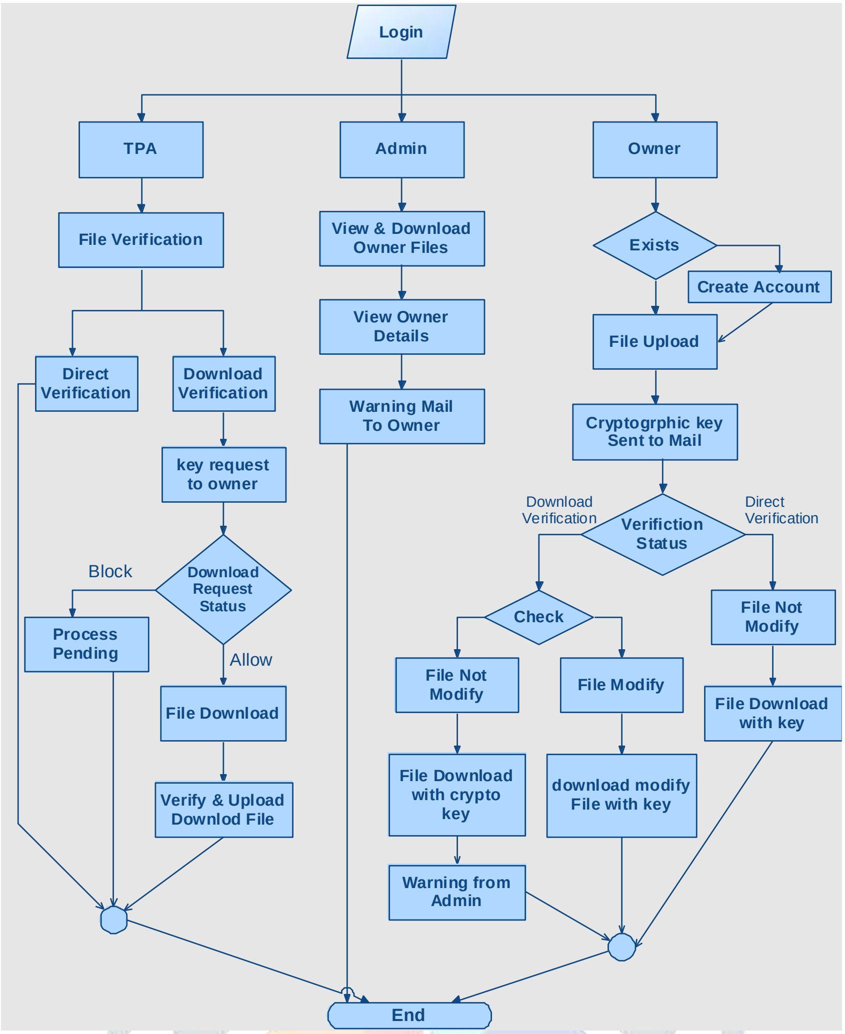

Figure 1: Flow of proposed work

IV. RESULT AND DISCUSSION

The proposed method is evaluated using following parameters: Accuracy, Memory consumption.

Table 1: Types of Query with memory usage

Type of Query	**Memory consumption**		
	Tumbling window	**Sliding window**	**Tripled window**
Select query	35	20	10
Aggregation query	38	25	15
Query with joins	62	50	40

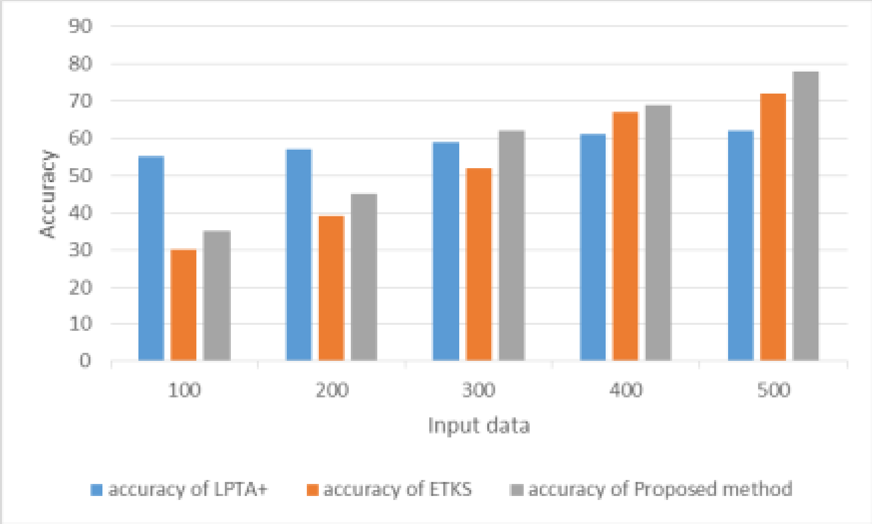

Figure 2: Accuracy graph

V. CONCLUSION

An effective and efficient query processing strategy have been presented for temporal localization of similar content from a long unsegmented video stream, considering target subsequence may be approximate occurrence of potentially different ordering or length with query clip. In the preliminary phase, the similar frames of query clip are retrieved by a batch query algorithm. Then, a bipartite graph is constructed to exploit the opportunity of spatial pruning; thus, the high-dimensional query and database video sequence can be transformed to two sides of a bipartite graph. Only the dense segments are roughly obtained as possibly similar subsequences. In the filter-and-refine phase, some nonsimilar segments are first filtered, several relevant segments are then processed to quickly identify the most suitable 1:1 mapping by optimizing the factors of visual content, temporal order, and frame alignment together. In practice, visually similar videos may exhibit with different orderings due to content editing, which yields some intrinsic cross mappings

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