International Journal of Electrical and Electronics Engineers
Vol. No.8 Issue 01, January-June 2016
www.arresearchpublication.com
IJEEE
ISSN 2321 - 2055

AN EFFECTIVE APPROACH FOR VIDEO COPY DETECTION USING SIFT FEATURES

Miss. S. V. Eksambekar[1] Prof. P.D.Pange[2]

[1, 2]*Department of Electronics & Telecommunication,*

Ashokrao Mane Group of Intuitions, Wathar turf Vadgaon, Kolhapur(India)

ABSTRACT

We propose in this paper an effective approach for video copy detection using SIFT features. The purpose of video copy detection is to decide whether a video segment is a copy of video from train video database or not. We first use dual-threshold method to segment the videos into segments with homogeneous content and extract key frames from each segment. SIFT features are extracted from the key frames of the segments. We use SIFT algorithm to compare SIFT features of the two frames in the whole framework. Video sequence matching is used to match the query video and train video. If the video copy detection system finds a matching video segment, it returns the name of copy video in the video database and the time stamp where the query was copied from.

Keywords: dual threshold method, key frames, SIFT features, video copy detection

I.INTRODUCTION

Due to rapid development of multimedia hardware and software technologies, the cost of image and video data collection, creation, and storage is becoming low. Every day lots of video data are generated and published. Among these huge volumes of videos, there exist large numbers of copies. According to statics 27 % redundant videos are duplicated on the most popular version of a video in the search results from video search engines. Therefore an effective and efficient method for video copy detection has become more and more important.

Also users are often frustrated when they need to spend their valuable time to find videos of interest; they have to go through number of duplicated or nearly duplicated videos that are streamed over the internet before arriving at an interesting one. Because of these duplicated video lots of storage space and users time can be wasted. To avoid this situation we need an efficient and effective copy detection and elimination which is essential for effective search, retrieval and browsing.

The aim of video copy detection is to decide whether a query video segment is a copy of a video from the video data set. Video copy detection system tries to finds a matching video segment, and then it returns the name of copy video in the video database and the time stamp where the query was copied from.

1.1 Relevance

The objective of the video copy detection is to find whether the query video sequence exists in the target video or not. Whether there exists a copy in the video, what is the length of copy clip, and where is start and end position these are some difficulties related to video copy detection, which makes video copy detection more difficult than the ordinary video retrieval.

To resolve this problem, we propose a video copy detection using scale invariant feature transform algorithm. This method has the advantages of high accuracy in locating copies, being able to compensate the deficiency in description of image low level features, reducing detection time costs, and being able to simultaneously locate more than one copy in two comparing video sequences. The Scale invariant feature transform (SIFT) algorithm is used to match two images with Scale invariant feature transform feature point sets and comparing the similarity of two key frames in the whole framework. Also the dual threshold method used to segment the video into segments and extract key frames from each segment.

II.LITERATURE REVIEW

2.1.Xiao Wu et al. (2009)

In this paper, time duration and thumbnail image are two critical context features used to eliminate the near-duplicate web videos. In this paper, the contextual information from time duration, number of views, and thumbnail images with the content analysis derived from color and local points to achieve real-time near-duplicate elimination.

2.2.Zi Huang et al. (2010)

This paper presents an accurate and practical system for online near-duplicate subsequence detection over continuous video streams. This method propose to transform a video stream into a one-dimensional video distance trajectory (VDT) monitoring the continuous changes of consecutive frames with respect to a reference point, which is further segmented and represented by a sequence of compact signatures called linear smoothing functions (LSFs). To avoid unnecessary sequence similarity computations, an efficient sequence skipping strategy is also embedded.

2.3.Yonghong Tianl et al. (2011)

In this paper, the method proposes video copy detection approach which exploits complementary audio-visual features and sequential pyramid matching (SPM). Several independent detectors first match visual key frames or audio clips using individual features, and then aggregate the frame level results into video level results with SPM, which calculates video similarities by sequence matching at multiple granularities. Finally, detection results from basic detectors are fused and further filtered to generate the final result.

2.4.Mohammad Athar Ali et al. (2012)

This paper proposes an efficient video copy detection method for the H.264/AVC standard. The mechanism is based on content based copy detection (CBCD). The proposed method divides each frame within a group of three consecutive frames into a grid. Each corresponding grid across these groups of frames is then sorted in an ordinal vector which describes both, the spatial as well as the temporal variation. This ordinal matrix based copy-detection scheme is effective in detecting not only a copied video clip but also its location within a longer video sequence. The technique has been designed to work in the compressed domain which makes it computationally very efficient.

III.SCOPE OF THE PROPOSED WORK

Global descriptor can be used for video copy detection. Spatiotemporal low-level features of the whole image are used for the methods based on global descriptor method. The features can be color histogram, color layout descriptor and so on. Simple computations capable of dealing with copies with relatively small changes are some of the advantages of these methods. But the performance on detecting copies with complicated transformations is not satisfactory.

The study showed that SIFT descriptor performs better in identifying the objects. It has good tolerance to scale changes, illumination variations, and image rotation as well as it is robust to affine distortion, change of viewpoints, and additive noise. So in proposed method using auto dual threshold method frames will be extracted from Reference video. After that SIFT feature will be extracted from frames. Matching process done with the help of SIFT key points feature between query frame image and different frames of reference video in Data base. If a video copy detection system finds a matching video segment, it returns the name of copy video in the video database and the time stamp where the query was copied from.

IV.PROPOSED WORK

The proposed work is as follows:

1. As shown in Fig.1 first use the auto dual threshold method to segment the videos into segments with homogeneous content.
2. Extract key frames from each segment.
3. SIFT features are extracted from the key frames of the segments.
4. We use SIFT algorithm to match two video frames with SIFT point set descriptors and to obtain video sequence matching result.

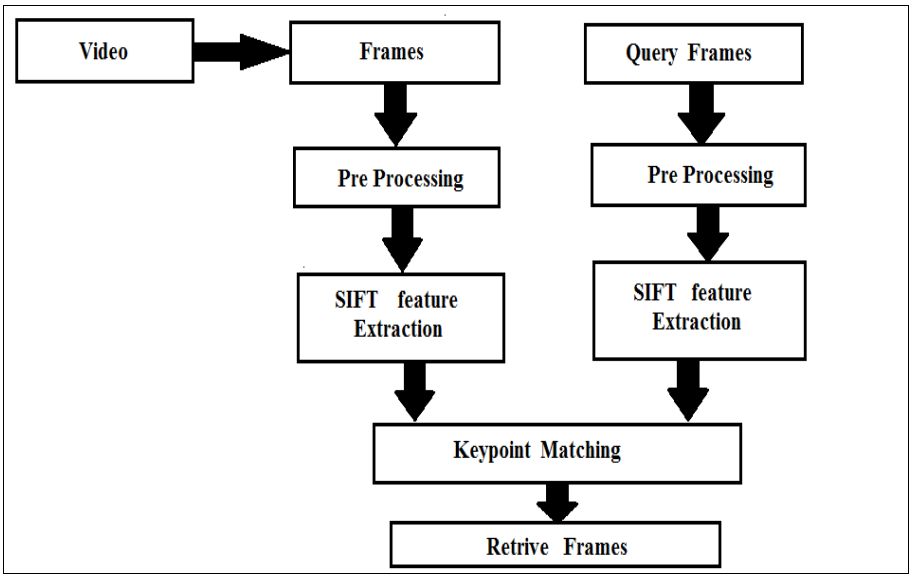

Fig.4.1: block diagram

4.1 Auto dual threshold

This method is used to eliminate the redundant video frames. This method cuts consecutive video frames into video segments by eliminating temporal redundancy of the visual information of consecutive video frames.

4.2 SIFT descriptor

In SIFT it uses the matching algorithm. Cross-correlation between the image grey levels returned unstable performance, depending on the kind of transformation considered. The considerations above suggested the use of a SIFT descriptor. The reason for this behavior is in the feature descriptor adopted.

4.3 Key point Matching

The best candidate match for each key point is found by identifying its nearest neighbor in the database of key points from training images. The nearest neighbor is defined as the key point with minimum Euclidean distance for the invariant descriptor vector.

VI.CONCLUSION

Due to the number of SIFT point extracted from a video is large, hence the video copy detection using SIFT features has high computational cost. So that we use the dual threshold method to eliminate redundant video frames and use the video sequence matching for finding a video copy.

When various transformations applied to the original image like picture in picture, insertion of patterns, strong re-encoding and these kinds of duplicate images used in videos ,in that case video copy detection is very useful.

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