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Digital Video Watermarking Based On SWT

P.Saradha¹, A.Kumar²

M.E-Applied Electronics, Varuvan Vadivelan Institute of Technology, Dharmapuri, India¹.

Assistant Professor, ECE dept, varuvan vadivelan institute of technology, dharmapuri, india².

ABSTRACT: The main objective of this project is to develop an efficient watermark extraction system for the localization of watermark data from the video image sequence. The project also aims in recognizing the extracted watermark data and make it editable for further modifications. The project implemented, performs transformation analysis on existing wavelet transforms for the suitability of wavelet transformation for watermark isolation having multiple features. The recognition of watermark characters from the isolated documented video image making it editable for further modifications.

I. INTRODUCTION

This project implements an efficient system for the extraction of watermark from a given away documented video clips and recognizes the extracted watermark data for further applications. The implemented project work finds efficient usage under video image processing. The proposed work will be very useful under digital library maintenance of video database.

Following are the areas of application of watermark isolation and recognition in video images;

1. **Digital library:** For maintenance of documented video images in large database.
2. **Data modification:** Useful under modification of informations in video images.
3. **Cinematographic applications:** For enhancing the document information in movie video clips.
4. **Instant documentation of news and reports:** For documentization of instant reports and news matters in paper.
- 5.

II. RELATED WORK

Existing System: Single frame/image watermark detection algorithm using SWT and unsupervised classification is used to locate the watermark in videos. A set of feature vectors is generated for the connected components (CC) produced by SWT. It uses bandlet-based edgedetector to accurate edge location. An inpainting algorithm 3D volumeregularization algorithm is used fill-in their remaining regions by appropriate data.

Disadvantages:

1. To detect watermark with different size uses differentscaled stroke filter. But stroke filter is time consuming when the stroke scale is large.
2. Stroke in different scale may affect each other. Small watermark and large watermark are detected in one candidate region which is hard to process.
3. tracking-based watermark detection methods the accuracy of detected watermark locations in each frame significantly affects the performance of the video watermark detector.
4. A large training set is used.

The purpose of this project is to implement, compare, and contrast the edge-based and the connected component methods. The other methods mentioned here are examples of watermark extraction techniques that can be used for future projects. Various methods have been proposed in the past for detection and localization of watermark in images and videos. such as color, intensity, connected-components, edges etc. we use orientation code matching to find the best matching patch in other frames, and calculate the approximated rotation angle between these two patches. Then rotate and copy the best matching patch to fill the moving objects in the foreground that are occluded by the region to

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be inpainted. In the second step, the background is filled in by temporal copying and priority based watermark ure synthesis.

For the video sequence in which the repetitive motion is absent, we perform the orientation code matching. Instead of simple window-based matching, our approach allows matching by rotating the target patch by certain angles and finding the best match with the minimum difference. The gradient information of the target patch in the form of orientation codes is utilized as the feature for approximating the rotation angle as well as for matching.

III.ALGORITHM AND FLOW CHART

We are using edge detection approach as it is simple to implement and is also works almost efficiently. The algorithm as well as the flow chart for our software is shown below

ALGORITHM

1. Take the frame
2. RGB to Gray image
3. defining the angles
4. Edge detection
5. Defining thresholds for vertical and horizontal watermark segmentation
6. X and Y projection using threshold
7. Binarization

This algorithm is the realized by using a flowchart and is implemented with matlab of version7.0. This algorithm is simple to implement and the matlab has sufficient commands to implement this particular algorithm with relatively small number of steps.

The basic steps of the edge-based watermark extraction algorithm are given below.

Create a Gaussian pyramid by convolving the input image with a Gaussian kernel and successively down-sample each direction by half.

1. Create directional kernels to detect edges at 0, 45, 90 and 135 orientations.
2. Convolve each image in the Gaussian pyramid with each orientation filter.
3. Combine the results of step 3 to create the Feature Map.
4. Dilate the resultant image using a sufficiently large structuring element (7x7 [1]) cluster candidate watermarkregions together.
5. Create final output image with watermarkin white pixels against a plain black background.

Brief Description

Connected components labeling scans an image and groups its pixels into components based on pixel connectivity, *i.e.* all pixels in a connected component share similar pixel intensity values and are in some way connected with each other.

connected components algorithm

In graph theory, a connected component of an undirected graph is a subgraph in which any two vertices are connected to each other by paths, and which is connected to no additional vertices in the supergraph. For example, the graph shown in the illustration on the right has three connected components. A graph that is itself connected has exactly one connected component, consisting of the whole graph

WATERMARK DETECTION

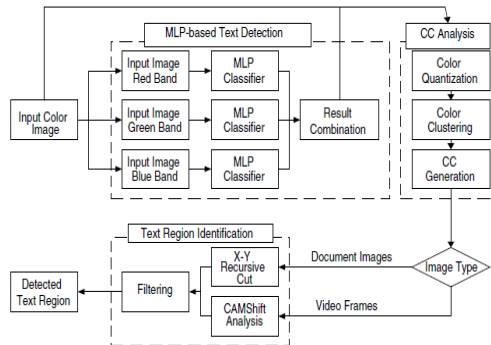
The term watermark detection here means the distinguishing the letters or the characters from the image part. which should guarantee that a character is segmented into a few connected components (Zhong et al., 2000). On the other hand, watermark ure-based methods regards watermark regions as watermark ured objects and apply Gabor filters, Wavelet, FFT, and spatial variance to exploit the watermark ural properties. These utilizations of watermark ural

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information for watermark detection are sensitive to various font styles, sizes, and colors. Therefore, it is difficult to generate a watermark ure filter set which is appropriate for each application. Fig.3.3 gives an overall structure of the proposed approach. Our algorithm resolves this problem by using MLPs.



Proposed watermark detection algorithm

Bootstrap method is used to force the MLPs to learn a precise boundary between watermark and non-watermark classes, which leads to reliable detection performance for various conditions of watermarks in real scenes. In order to tackle this problem of the watermark ure-based methods, we use CC-based filtering of non-watermark regions. The output of the MLP goes through color quantization, color clustering, and CC generation. We have applied three stages of filtering on CCs using (1) features of CCs such as area, fill factor, and horizontal and vertical extents, (2) geometric alignment of watermark components, and (3) shape information of CCs. After CC-based filtering we take two different region-marking approaches depending on the given image types (video image and document image) to enhance time performance and get better results. Video images have relatively small watermark regions compared with non-watermark regions.

IV. CONCLUSION

I conclude that here my project will be very useful for many applications like tv channels. And my algorithm of SWT is very efficient one compared to the existing new embedding algorithm and the time also required less in my project because of the algorithm SWT.