

A Review paper on Digital video watermarking for data prevention in copyrighting

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Abstract— A watermark is symbol of origin, ownership, copyright etc. A watermark is embedded in the multimedia content like video or image. When watermark is inserted in the video is known as video watermarking and when watermark is inserted in the image is known as image watermarking. Video watermarking is more secure and qualitative than the image watermarking because in video watermarking there is availability of additional data. To embed a predefined watermark in the video frame, there are two techniques. One is pseudo random sequence which is used for objective detection and other technique is binary image or gray image which is used for subjective detection. In this thesis, in order to subjectively verify the ownership of video frame with the aid of extracting of watermark, a binary logo image is used as a watermark bit is either 1 or 0.

Keywords— Video Watermarking, Watermark protection, Feature detector, Image Steganography, Feature Point, histogram equalization, fractal coding algorithm.

INTRODUCTION

A watermark is a symbol which represents origin, ownership and copy control etc. A watermark is logo in an image or video that may be a combination of lightness or darkness. Watermark can be seen on passport's, postage stamps, bank notes, government documents etc. The watermark can be embedded either in image or in video the process of embedding watermark in video is called video watermarking and the process of embedding watermark in an image is known as image watermarking. Watermark can be embedded and extracted as per requirement. The difference between video watermarking and the image watermarking is the availability of the data. This proper availability of data in video watermarking make this technique more reliable and redundant because information hide in watermark is more secure and qualitative in nature.

Digital watermark can be defined as hiding the information in the digital form which may be digitized music, video, picture or any other file. In this the carrier signal hides the information.

The hidden information should contain a relation to the carrier signal but it is not compulsory. If it contains a relation with the carrier signal it helps to check the authenticity of the carrier signal.

Various techniques are used as:

- DWT- Discrete wavelet transform
- DCT- Discrete cosine transform
- SVD- Singular value decomposition
- PCA- Principal component analysis

Applications:

Digital watermarking may be used for a wide range of applications, such as:

1. Copyright protection.
2. Source tracking.(different recipients get differently watermarked content)
3. Broadcast monitoring. (television news often contains watermarked video from international agencies)
4. Video authentication.

Digital watermarking life cycle:

The digital watermark can be defined as the information where information is embedded in the signal. The signal in which the watermark is embedded is known as host signal. This whole process takes place in three steps, embedding, attack & detection. In embedding an algorithm accepts the host and the data to be embedded and produces a watermarked signal. Then this watermarked

signal is stored a forwarded to another person. If this person any change or modification in the received signal, is known as or termed as attack. Attack can be defined as they tend of effort make by third party to make any change in the watermark. The modifications that can be done on watermark are cropping, rotating, scaling etc. Detection is also known as extraction this algorithm is applied to the attack signal in order to extract watermark. If there is no change or modification made in the signal then the watermark maintained its quality and can be extracted.

LITERATURE SURVEY

1. Jian Lu, 2014“A Robust Fractal Color Image Watermarking Algorithm” One of the main objectives of watermarking is to achieve a better tradeoff between robustness and high visual quality of a host image. In recent years, there has been a significant development in gray-level image watermarking using fractal-based method. This paper presents a human visual system (HVS) based fractal watermarking method for color images. In the proposed method, a color pixel is considered as a 3-D vector in rgb space. And a general form of 3×3 matrix is utilized as the scaling operator. Meanwhile, the luminance offset vector is substituted by the range block mean vector. Then an orthogonalization fractal color coding method is achieved to obtain very high image quality. We also show that the orthogonalization fractal color decoding is a mean vector-invariant iteration. So, the range block mean vector is a good place for hiding watermark. Furthermore, for consistency with the characteristics of the HVS, we carry out the embedding process in the CIE space and incorporate a just noticeable difference (JND) profile to ensure the watermark invisibility. Experimental results show that the proposed method has good robustness against various typical attacks, at the same time, with an imperceptible change in image quality.

2. Saeed Ahmed Sohag, Dr. Md. Kabirul Islam, Md. Baharul Islam,2013, “A Novel Approach for Image Steganography Using Dynamic Substitution and Secret Key” In this paper Steganography is a system that hides information in an application cover carrier like image, text, audio, and video. Considerable amount of work has been carried out by different researchers on this subject. Least Significant Bit (LSB) insertion method was more suspicious and low robustness against attacks. The objectives of this study were to analyze various existing system and implement a dynamic substitution based Image Steganography (IS) with a secret key. Our proposed method is more difficult to attack because of message bits are not inserted in to the fixed position. In our method, the message bits are embedded into deeper layer depending on the environment of the host image and a secret key resulting increased robustness. The robustness specially would be increased against those intentional attacks which try to reveal the hidden message.

3. Vipul Sharma, Sunny Kumar, 2013, “A New Approach to Hide Text in Images Using Steganography” In this paper we have proposed a new steganographic algorithm that is used to hide text file inside an image. In order to increase maximize the storage capacity we have used a compression algorithm that compresses the data to be embedded. The compression algorithm we have used works in a range of 1bit to 8 bits per pixel ratio. By applying this algorithm we have developed an application in that would help users to efficiently hide the data.

4. Anil Kumar, Rohini Sharma,2013, “A Secure Image Steganography Based on RSA Algorithm and Hash LSB Technique” In this paper Steganography is a method of hiding secret messages in a cover object while communication takes place between sender and receiver. Security of confidential information has always been a major issue from the past times to the present time. It has always been the interested topic for researchers to develop secure techniques to send data without revealing it to anyone other than the receiver. Therefore from time to time researchers have developed many techniques to fulfill secure transfer of data and steganography is one of them. In this paper we have proposed a new technique of image steganography i.e. Hash - LSB with RSA algorithm for providing more security to data as well as our data hiding met hod. The proposed technique use hash function to generate a pattern for hiding data bits into LSB of RGB pixel values of the cover image. This technique makes sure that the message has been encrypted before hiding it into a cover image. If in any case the cipher text got revealed from the cover image, the intermediate person other than receiver can't access the message as it is in encrypted form.

5. Abbas Cheddad, Joan Condell, Kevin Curran and Paul Mc Kevitt, 2010, “Digital Image Steganography: Survey and Analysis of Current Methods” Steganography is the science that involves communicating secret data in an appropriate multimedia carrier, e.g., image, audio, and video files. It comes under the assumption that if the feature is visible, the point of attack is evident, thus the goal here is always to conceal the very existence of the embedded data. Steganography has various useful applications. However, like any other science it can be used for ill intentions. It has been propelled to the forefront of current.

PROBLEM FORMULATION

There are many algorithms which have used to embed watermark but they lack in few stages. Video watermarking approaches can be divided into two main categories which depend on the method of hiding watermark bits in the host video. These are: By just manipulating the pixel intensity values of the video frame. Second alter is spatial pixel values of the host video according to a pre-determined transform. But attacks like cropping, scaling, rotations and geometrical make these techniques unsuccessful. The commonly used transform domain techniques are Discrete Fourier Transform (DFT), the Discrete Cosine Transform (DCT), and the Discrete Wavelet Transform (DWT), PCA and SVD.

But they are not efficient in finding the interest points where to embed the watermark. Even they all are not so stable. Thus to overcome these issue a new technique is introduced in implementation of watermarking.

PROPOSED WORK

In general, there are two types of techniques for embedding a predefined watermark into an Video frame. One is pseudo random sequence which is used for objective detection and the other is binary image or gray image which is used for subjective detection. In this thesis, in order to subjectively verify the ownership of Video frame with the aid of extracting a watermark, a binary logo image is used. And the watermark bit is either 1 or 0. One of the main challenges of the watermarking is to achieve a trade-off between robustness and perceptivity. In general, increasing the strength of the embedded watermark can achieve robustness, but it would lead to an increase in the visible distortion as well, and vice versa. Since the orthogonal zed fractal decoding is mean-invariant iteration, the range block mean is a good robust place to hide a watermark. After fractal decoding, the embedded watermark diffuses throughout the reconstructed Video frame .In order to gain high robustness as well as low sensitivity in Video frame watermarking, the knowledge of human visual perception of colour stimuli must be well utilized in designing embedding algorithms. The watermark insertion procedure is and includes the following steps.

- Selection of video from user to process
- Extraction of video frame for watermark hiding
- Factually encode the original Video frame to produce the fractal coded frame in *RGB* space.
- Convert the range block means from *RGB* space to $La*b^*$ space and denoted by Ru .
- Embed the permuted watermark into Ru .
- Convert $Ru1$ back to *RGB* space and denote them by $Ru2$.
- Hide the watermark by performing fractal decoding.

CONCLUSION

The fractal coding image watermark image algorithm is robust and imperceptible in nature that helps to increase the robustness and will maintain the quality of video and embedded watermark by using histogram equalization for security purpose a frame is chosen from the video which has highest entropy. This entire technique will provide a highest PSNR ratio, lowest mean square & bit error.

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