

## Video Watermarking using Image Processing

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### ABSTRACT

*Video watermarking is a data hiding technique where an information or message is hidden inside a signal transparent to the user. This technique can be used for copyright protection, piracy tracing, content authentication, advertisement surveillance, error resilience and so forth. In this project, we are using object reader to convert video into number of frames. To select one frame and convert it into RGB to Grey level. After this DWT is applied to cover image i.e. selected frame. Similar action will be carried on the text data frame. Then cover frame and text frame of their grey format are combined together by using alpha blending technique to get Watermarked Image. Then the IDWT (Inverse discrete wavelet transform) is applied. This Watermarked image is in grey form which will have to be converted into RGB form, by using grey to RGB converter. At last recollection of frames takes place by using object reader to obtain Watermarked Video.*

### Keywords

*Digital Image processing, Watermark ,DWT.*

### INTRODUCTION

#### 1.1 Steganography (art of hidden writing)

A term derived from the Greek words “steganos” and “graphia” (The two words mean “covered” and “writing”, respectively). The art and science of writing hidden messages in such a way that no one apart from the intended recipient knows of the existence of the message. The existence of information is secret.

#### 1.2 Cryptography

The conversion of data into a secret code for transmission over a public network. Today, most cryptography is digital, and the original text ("plaintext") is turned into a coded equivalent called "cipher text" via an encryption algorithm. The cipher text is decrypted at the receiving end and turned back into plaintext.

Encryption /Decryption



Fig1.2: Cryptography

### 1.3 Watermarking

- A distinguishing mark impressed on paper during manufacture; visible when paper is held up to the light (e.g. \$ Bill)
- Physical objects can be watermarked using special dyes and inks or during paper manufacturing.

### 1.4 History of watermarking

The term “watermark” was probably originated from the German term “wassermarke”. Since watermark is of no importance in the creation of the mark, the name is probably given because the marks resemble the effects of water on paper. Papers are invented in China over a thousand years ago. However, the first paper watermark did not appear until 1282, in Italy. By the 18th century, watermarks on paper in Europe and America had been used as trademarks, to record the manufactured date, or to indicate the size of original sheets. Watermarks are commonly used on bills nowadays to avoid counterfeiting.

### 1.5 How Watermarking is Different from Steganography and Cryptography

#### 1.5.1 Steganography vs. Watermarking

- The main goal of steganography is to hide a message  $m$  in some audio or video (cover) data  $d$ , to obtain new data  $d'$ , practically indistinguishable from  $d$ , by people, in such a way that an eavesdropper cannot detect the presence of  $m$  in  $d'$ .
- The main goal of watermarking is to hide a message  $m$  in some audio or video (cover) data  $d$ , to obtain new data  $d'$ , practically indistinguishable from  $d$ , by people, in such a way that an eavesdropper cannot remove or replace  $m$  in  $d'$ .
- It is also often said that the goal of steganography is to hide a message in one-to-one communications and the goal of watermarking is to hide message in one-to-many communications.
- Shortly, one can say that cryptography is about protecting the content of messages, steganography is about concealing its very existence.
- Steganography methods usually do not need to provide strong security against removing or modification of the hidden message. Watermarking methods need to be very robust to attempts to remove or modify a hidden message.

#### 1.5.2 Cryptography vs. Watermarking

- Watermarking is totally different technique from cryptography. Cryptography only provides security by encryption and decryption. However, encryption cannot help the seller monitor how a legitimate customer handles the content after decryption. So there is no protection after decryption. Unlike cryptography, watermarks can protect content even after they are decoded.
- Other difference is cryptography is only about protecting the content of the messages. Because watermarks are inseparable from the cover in which they are embedded, so in addition to protecting content they provide many other applications also, like copyright protection, copy protection, ID card security etc.

**BLOCK DIAGRAM AND DESCRIPTION**

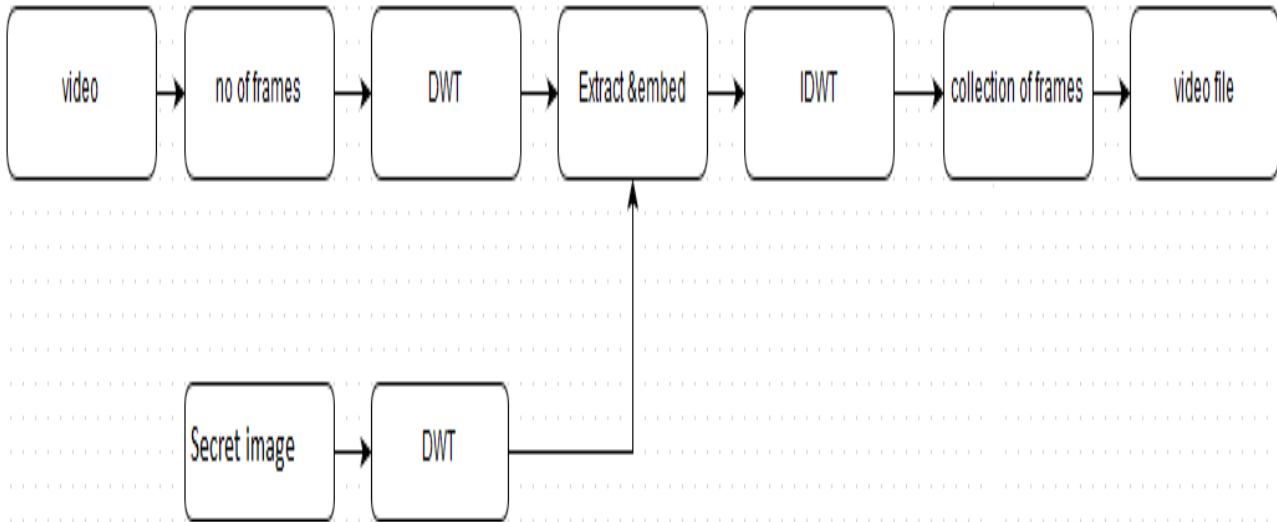


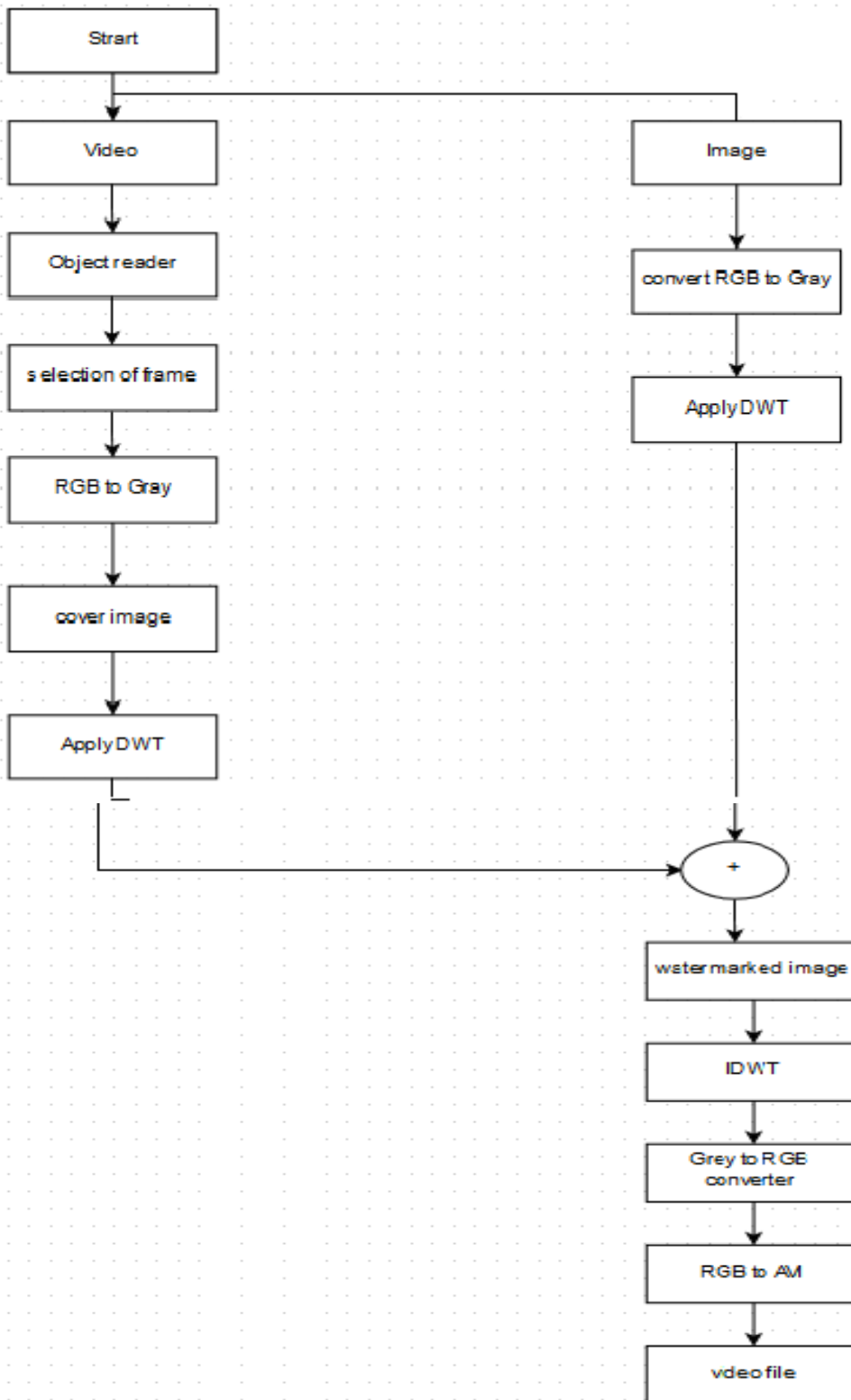
Fig. 2 Block diagram of video watermark

**2.1 Block diagram description of video watermarking:-**

1. The proposed watermarking technique is shown in fig.2 the proposed method embeds secret message into DWT coefficients in low frequency components and restores the original image coefficients after the secret messages have been extracted.
2. Wavelet transform is used to converts an image from time or spatial domain to frequency domain. Decomposition of digital image will be pair of waveform with high frequency corresponds to detailed parts of an image & low frequency to smooth parts of image.
3. The digital message will be embedding in low frequency components & the image will be reconstructed to get cover image with digital message hidden. Embedded image decomposed into inverse discrete wavelet transform.
4. Inverse wavelet transform is used to convert frequency domain to spatial domain. Hence it is frequency-time representation. Embedded image will be extracted in to sub-band frequencies using dwt method.
5. The digital data will be taken from the low frequency components & the extracted digital data will be compared with original message. This system includes these frames 1 frame is selected.
6. Conversion of RGB to Gray of that frame takes place by using RGB to Gray converter.
7. After that cover image is formed.DWT is applied to cover image. because information should be hide in to lowest frequency domain.
8. After that image block is taken. Conversion of that image block in to Gray form by using RGB to Gray converter.DWT is applied to image block to form watermark image.DWT version of both cover image and watermark image are embedded by using alpha binding technique.
9. After this process watermarked image is formed.
10. Recollection of frames takes place by using object reader. after that Gray to RGB conversion takes place.
11. After that IDWT is applied ,at the end we get watermarked video file.

**SOFTWARE SYSTEM DESIGN**

**FLOWCHART**



RESULT

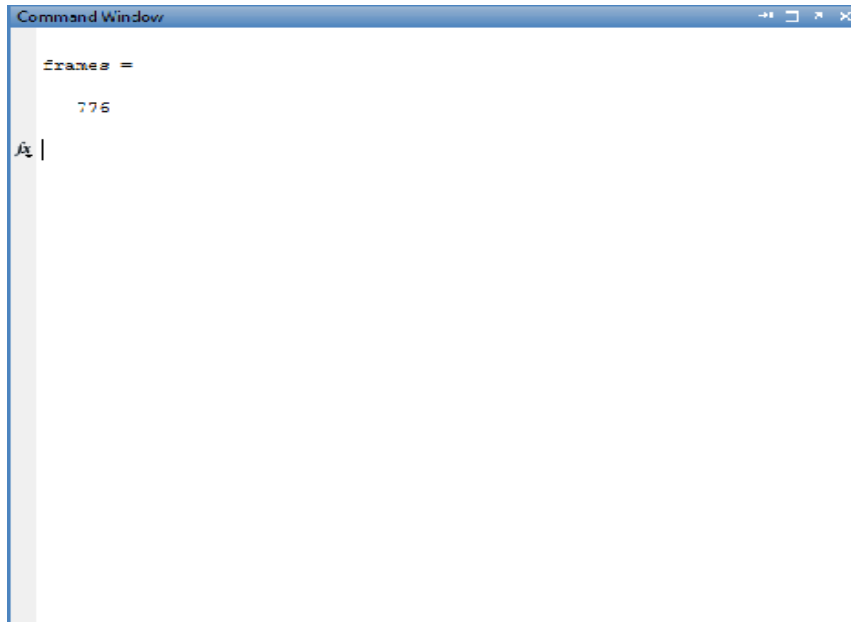


Fig 1 Total no of frames in video

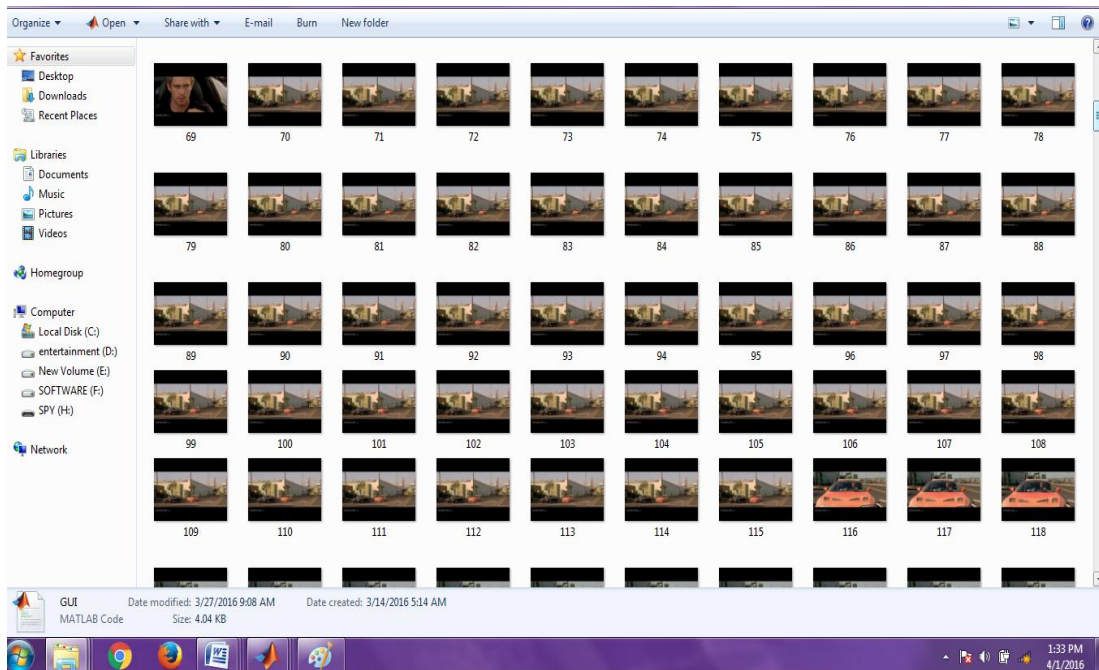


Fig 2 converted frames

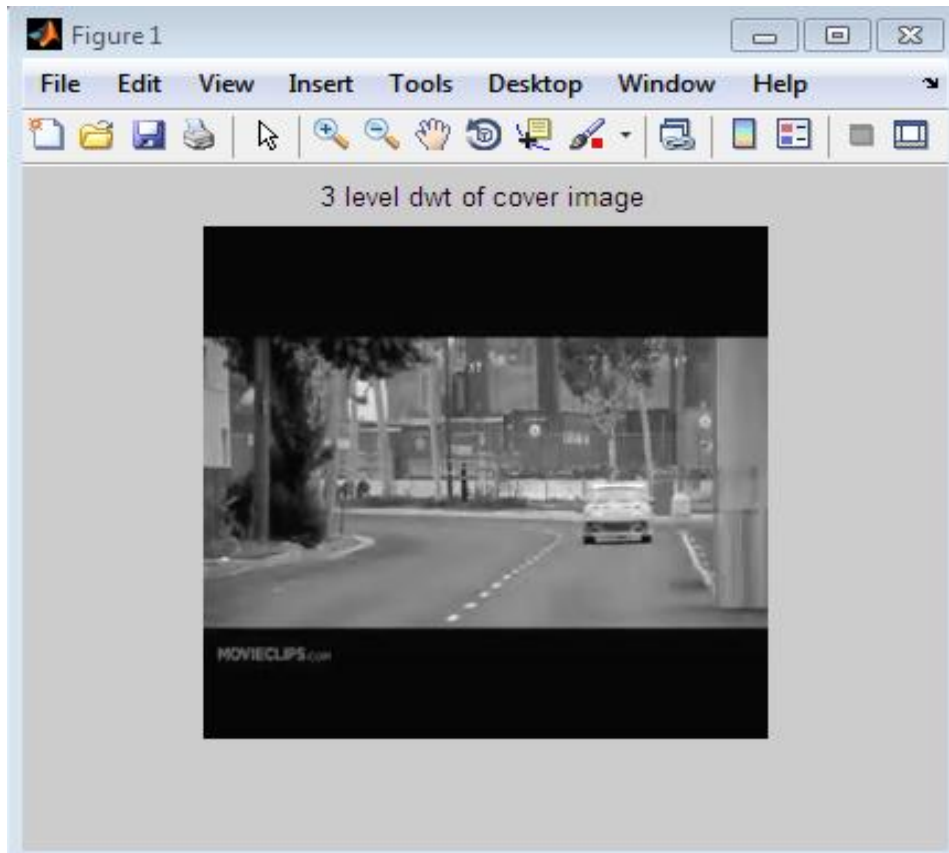


Fig 3 3 level DWT of cover image

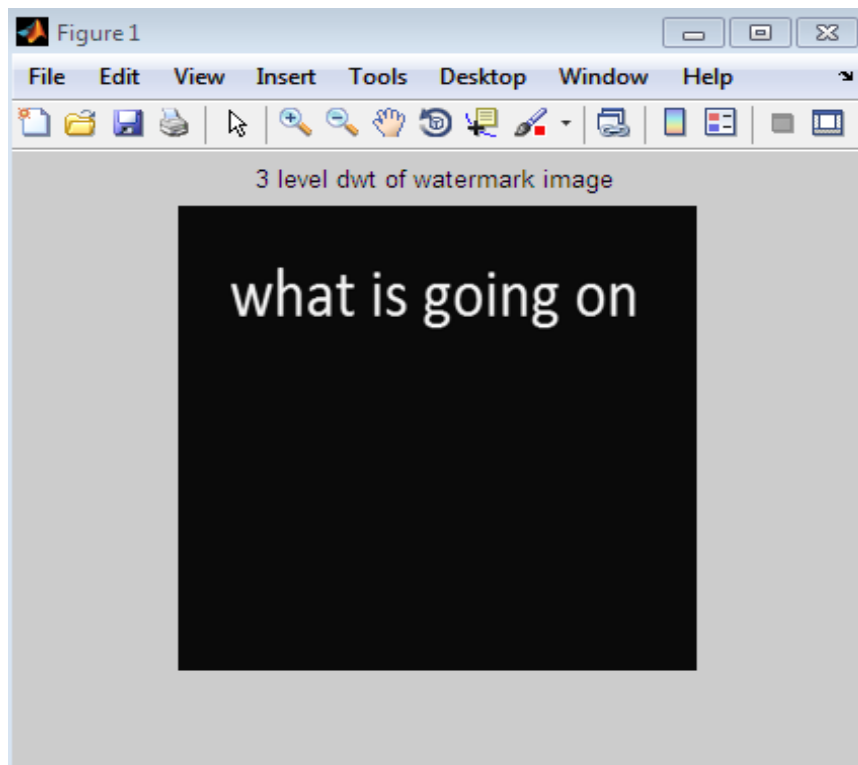


Fig 4 3 level DWT of watermark image

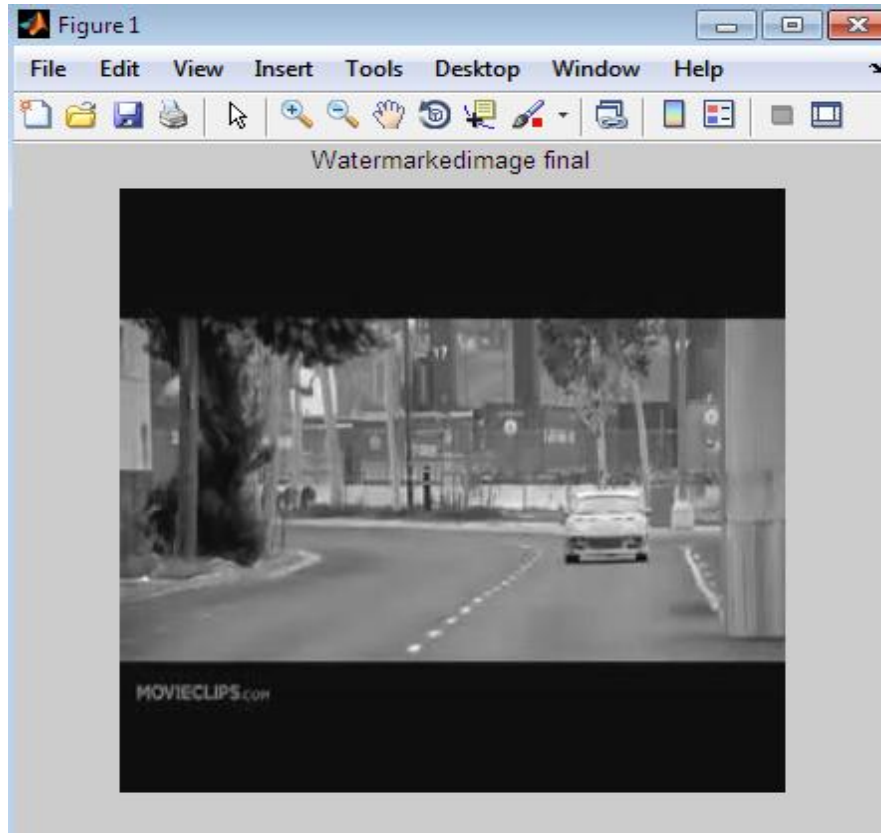


Fig 5 watermarked image

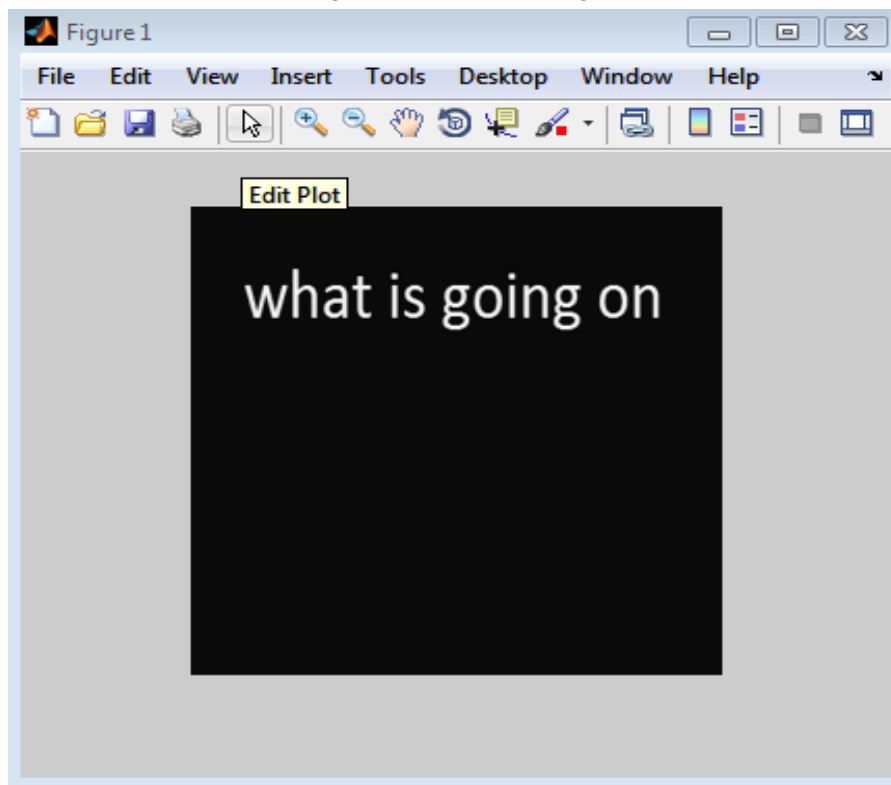


Fig 6 Extracted image



## CONCLUSION

The study indicates that it is possible to hide data in a video file by using Video Watermarking technique. Comparitively this technique is more achievable than Steganography or Cryptography.

In this Project we are also estimating the value of MSE and PSNR as a performance parameter of our project. Here we used DWT so that Image/Text file can be hidden into lowest frequency domain.

Hence we obtain Watermarked Image by combining both cover and Watermark Image by using Alpha Blending technique.

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