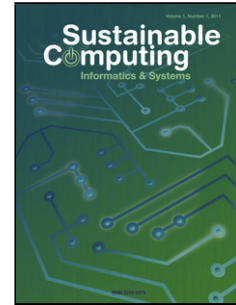


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# An Approach to Embed Image in Video as Watermark Using a Mobile Device

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**Abstract**— Evolution in communication media and Internet technology has made information access easier and faster. At the same time there has been a major concern towards the security of various multimedia objects. Multimedia objects are files that contain images, video clips etc are the most popular shared objects over the internet through various transferrable devices. One of the secured ways is Digital watermarking. Digital watermarking is the method to embed the secret data within text, image or video for ownership verification. In this work related to bitstream video watermarking technique, a study of spatial and temporal domain watermarking is carried out. An experiment is conducted to analyze the execution time of insertion and extraction process of bitstream watermarking on videos. Bit error count and power consumed by mobile device is computed for analysis of the bitstream video watermarking technique. As a proof of concept, the embedding of image on video is implemented using a computer and then the same logic is implemented for execution on a mobile phone. Experimental results demonstrate that, the method is feasible to be implemented using a computer and mobile phone. Image that is inserted on the video is extracted with an acceptable PSNR value. Execution time and power consumed in a mobile phone is within the acceptable limits. This ascertains the application's feasibility for a mobile phone.

**Keywords** — Bit stream, Watermarking, Binary image, Android, Mobile

## I. INTRODUCTION

The recent advancement in internet and various storage technologies has made the information access very easy for sharing and communication. The most regularly used mode of communication is mobile phones. In early days, mobile phones were confined to voice and text messages, with progression of technologies, present mobile phones stands out to be in all well-suited device. Android is a modified Linux based version of mobile operating system [1]. Digital multimedia contents like video, audio and images are accessibly on internet which increases the illegal activities like copyright destruction and duplication. Digital watermarking is one of the technique that provides solution for protecting the multimedia file from these activities. Digital Watermarking is a technique in which message such as image, audio, video or text can be inserted within the digital media in such a way that it should not cause violation to the original digital media.

Digital watermarking provides integrity, authorship, and ownership of the media in a cover data. A watermark can be a serial number or random number sequence, ownership identifier, information about the maker of the file, bi-level or gray level images, text or other digital data formats.

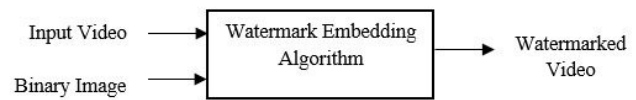


Fig. 1 Watermark Embedding

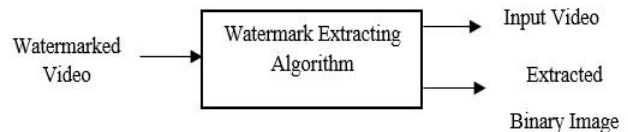


Fig.2 Watermark Extraction

Digital Watermarking process mainly consists of two phases namely Watermark embedding phase and Watermark extraction phase.

Fig.1 shows the working of watermarking embedding phase. In this stage the binary image is embedded in the original video by using the embedding algorithm the watermarked video is generated.

Fig.2 shows the working of watermarking extraction phase. In this stage watermark is detected or extracted from the watermarked video by applying extraction algorithm. Here the extracted binary image is generated.

## II. CONCEPT OF WATERMARKING

Digital watermarking is a process of embedding secret information in data in order to maintain its integrity, authorship, and ownership of the media in a cover data. The digital watermark was first coined by Andrew Tirket and Charles Osborne in 1992.

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