

# Deterrence of Piracy Employing IR Transmitter and Steganography System

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**Abstract** - Moving picture entertainment is a foremost source of amusement for populace in today's existence. To entertain populace a lot of investment is put into film production by the film makers. Their endeavour is being ruined by few people by pirate the movies substance. They do it by capture the video recording in mobile phone camera and upload it to websites or put up for sale it to people which cause huge loss. In this research work we are propose a novel technique for reduction of film piracy by avoiding fake video recordings of video in theatres. An indistinguishable luminosity is projected from the display to the whole spectators that falls on the camera lens which is sensitive to infrared light rays Makes the recorded video unfit to watch. A method is developed for anti-piracy system for film industry using steganography technique in MATLAB.

**Keywords:** IR Rays; Steganography; Colordetection algorithm; Cryptography

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## I. INTRODUCTION

The growth of the Internet has led to many new innovations in the way it is used. Internet can provide fast access to any kind of information and media, and the copyrighted contents.

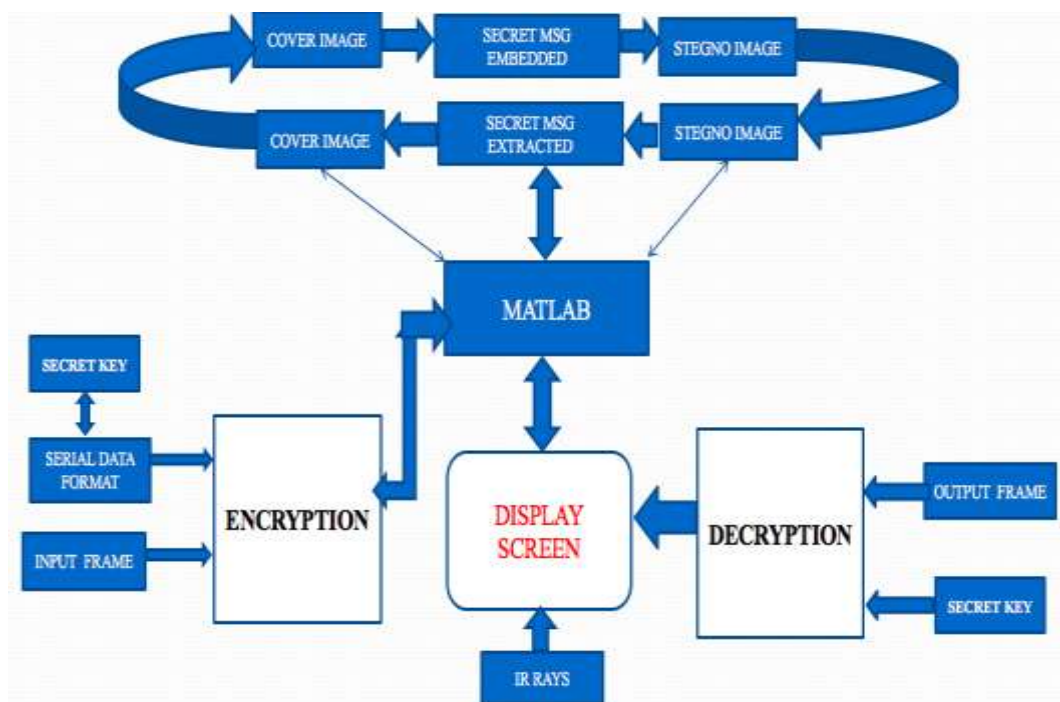
As motion picture piracy is the major concern in the film production, camcorder piracy is one of the main causes for piracy of the cinema. By means of camcorders movies can be record smoothly and later the same video can be uploaded in the internet as theatre print.

One more problem encountered is that, there is probability of movies in receiving of pirated still before it gets make public in theaters. Consequently many people's similar to working agent, theatre operators are associated in movie production process, they can duplicate and pirate the movie in good quality condition.

In this manuscript we employ a hi-tech method to decrease the camcorder piracy which happen by video recording in movie theater by means of cameras, this can be prevented by embed infrared LED's in the region of the screens of the theater. IR light is imperceptible to human being eye so it doesn't generate any predicament to the viewers while watching other than when the same IR rays falls on the camera it create interruption in the recorded video by means of this technique we can corrupt the eminence of the recorded video and this makes the recorded video in poor condition to watch.

Movies production is a massive industry as lot of people are linked and associated with it. Cinema piracy can happen previous to it is released in the theaters this can be reduced by a technological method, so we have planned to develop an anti-piracy system using modulo operator based steganography modus operandi in MATLAB and to design

and develop an IR based screen to disable mobile recording. Video steganography performs data hiding. The process of encryption and decryption is performed using this concept. Video steganography hides the secret key that is used for password authentication. All the secret data is hidden inside the desired frames of the video using Matlab software.



**Figure 1: System Implementation**

## II. LITERATURE REVIEW

Previous works about this area are premeditated thoroughly and many fascinating mechanism are reported in the literature review.

Hicham Tribak, et al.,[1] projected an Watermarked movie album find the precise location of the camcorder in the plays in order for estimation of the recording location in a theater by means of spread spectrum aural watermarking for the multichannel motion picture track .

B V V Rajesh Kumar, et al., [2] propose a method on license based anti-piracy broadcast arrangement. They proposed a IR Transmitters mounted in movie theaters in order to make the captured videos ineffectual.

Guangtao Zhai, et al., [3] projected TPVM scheme to apprehend the content guard in the theater by means of a new paradigm of information exhibit technology.

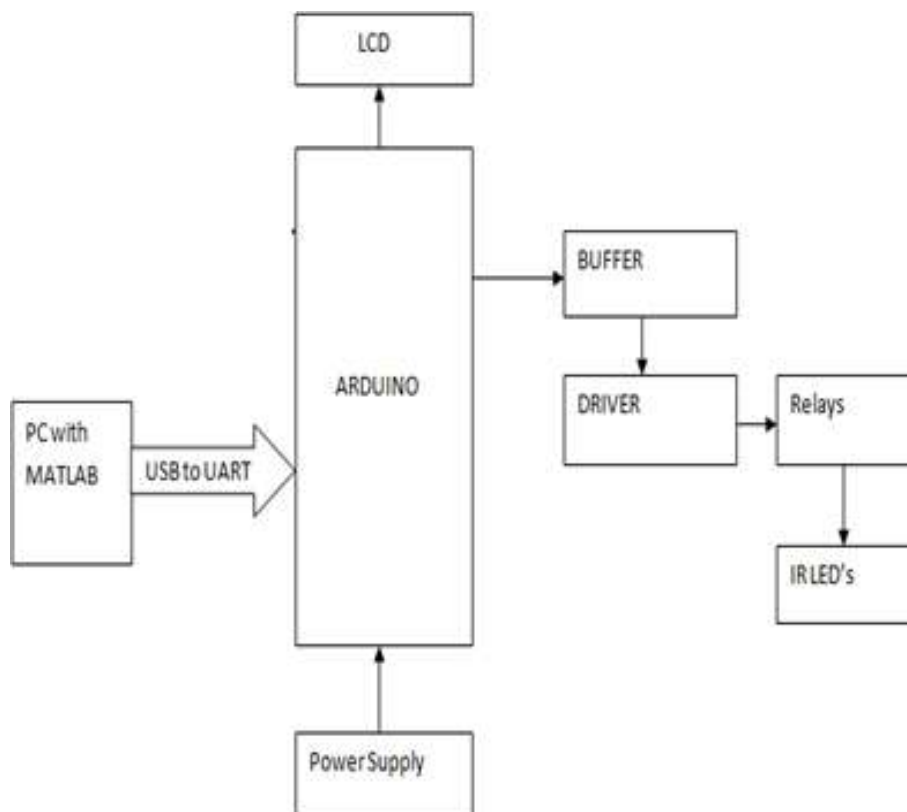
J Bloom, et al.,[4] designed Watermarking to track motion picture stealingto defeat the camcorder piracy by exploit the human being eye and camera.

Subsequent of studying the text by considering the prototype system in order to overcome, camcorder piracy in movie theatre, the following objectives were set

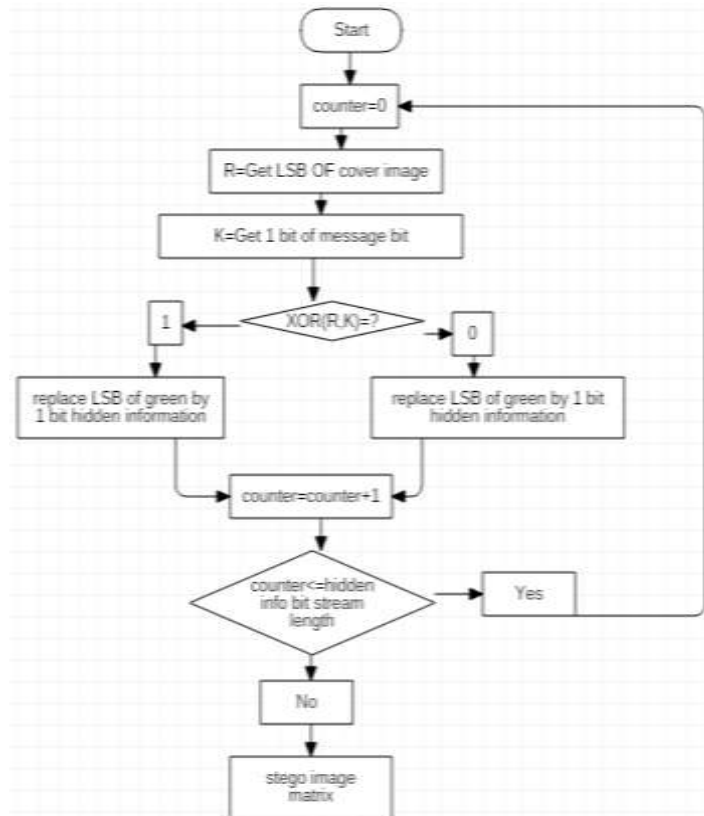
- Avoid piracy by using IR LEDs. The camera recording motivation be indistinguishable utilize IR transmitters.
- Digital watermarking technique to detect video piracy.

### III. METHODOLOGY

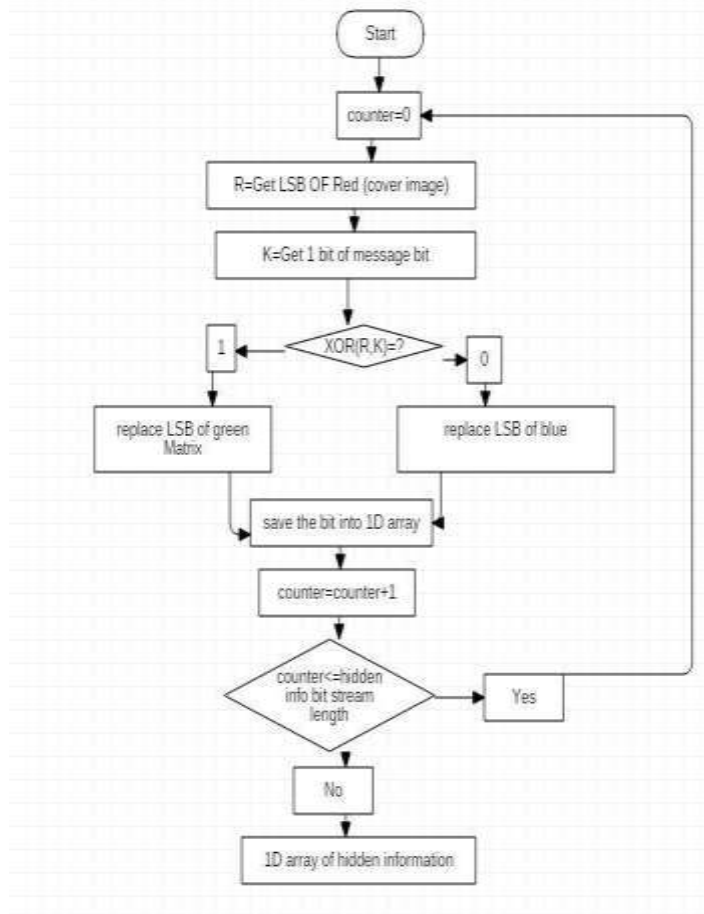
The block diagram of the movie piracy system using video steganography is shown in the Fig 2. Arduino Uno, is the heart of the system. It controls the majority operations of the system using Atmega microcontroller. Arduino is scripted by the Arduino IDE software. Video steganography is done using Matlab software. The system works in the following way On switching on the Arduino Uno micro controller as shown in the fig 2 the keypad gets activated for the password to be entered. If the password is verified the controller output is given to the driver through the buffer which provides impedance matching between them. Since the output from the micro controller is low, driver amplifies the signal and actuates the relays to control the IR LEDs. The signals that are transmitted by IR LEDs placed behind and also along the perimeter of the screen are emitted towards the audience. Subsequently these indistinguishable illuminations disturb the acquirement functions of the camera. On introduction of IR LEDs behind and in the region of the screen as in the cinema theatre, the video playing on the screen becomes smear or jumbled. Consequently, the audience will be capable to watch the movie exclusive of any disturbance but since the camcorders are susceptible to IR light the recorded content becomes smudge and in poor condition to watch.



**Figure 2: Block Diagram of Proposed System**



**Figure 3: Flow Chart of Encryption**



**Figure 4: Flow Chart of Decryption**

## Encryption

Figure 3 shows the encryption process

1. The process of encryption involves embed the undisclosed message into the cover image to obtain a stego image.
2. Encryption process is carried out on the cover image.
3. Stego image is an image similar to cover image with secret message embedded into it

## Decryption

Figure 4 shows the decryption process

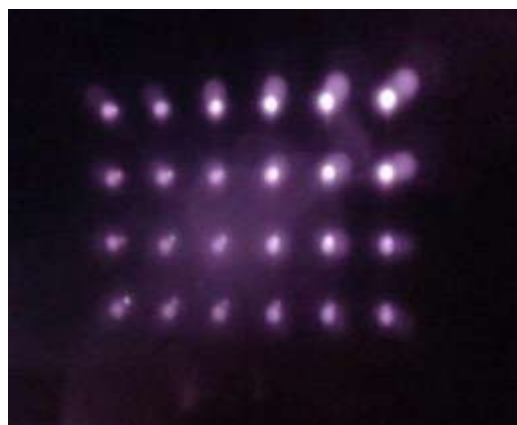
1. Decryption process involves extracting the secret message that was embedded in the encryption process.
2. Decryption process is carried out on the stego image.
3. Decryption process is performed exactly in the reverse process as of encryption.

**COLOR DETECTION ALGORITHM** is used for Embedding and Extracting Secret message from a Multimedia file

In this project design, we make use of IR LED transmitters and these transmitters are mounted all along the corners of the screen as well as these LED's emit high intensity of infrared rays along with the movie for the entire length of the movie projection. Because of this reason while the movie is recorded using camcorders. The signals are transmitted by IR LED's placed around the screen. IR signal from the IR LED's perturb the recording function of any camcorder exclusive of causing any disturbance to the audience who are surveillance the movie

The perceptible illumination ranges from 400nm-700nm, while IR light ranges from 700nm-1000nm. Infrared ranges from 700-780nm. The ranges of infrared rays defeat the camera sensors for recording.

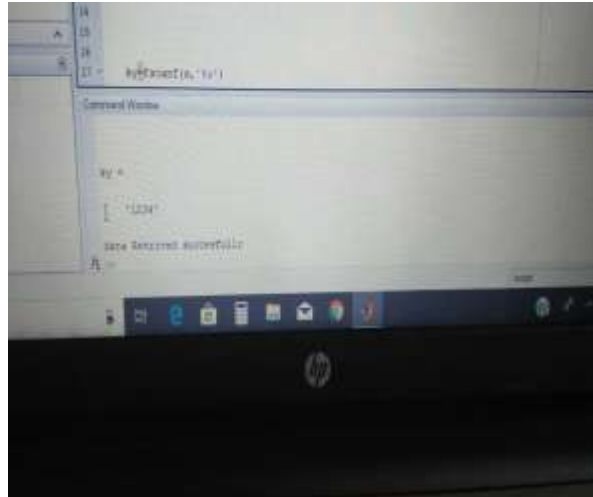
While somebody attempts to documentation a film on the screen by means of a video camera, the radiation emitted by the device will build optical watermarking on the screen that will blur the video images as shown in fig 5. Accordingly the motion picture image on screen is completely blurred, whilst seen through a camera, but will be clear for the human eye. Merely the blurred image will be captured by the camera so no more pirated videos, such as theater prints can be recorded.



**Figure 5: IR Led Place Around the Screen**

#### IV. RESULTS

The result of the implementation is as explained in the Figure 6, Figure 7, Figure 8 and Figure 9. The main aim of this method is to prevent recording of movies in theater. Thus targeting the grey market of piracy .there are numerous applications of this system which requires high degree of privacy and safety such as highly sensitive conferences, meetings etc.



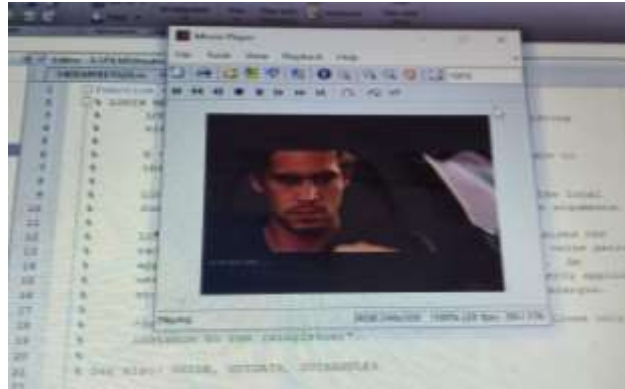
**Figure 6: Password Authentication**

Figure 6 shows that the password authentication is use to prevent the not permitted person from playing the movie. When password authentication fails movie cannot be accessed. This system create two situation one is legitimate and another one is unacceptable authentication.

As shown in Figure 7 and Figure 8, when the frame number and the secret key entered by the user is successfully authenticated, system displays as secret key matched and the movie starts to play.



**Figure 7: Password Authentication Successful**



**Figure 8: Movie being Displayed**

As soon as the frame number and the secret key entered by the user is wrong, system displays as Piracy detected and the movie doesn't play, that is shown in Figure 9.

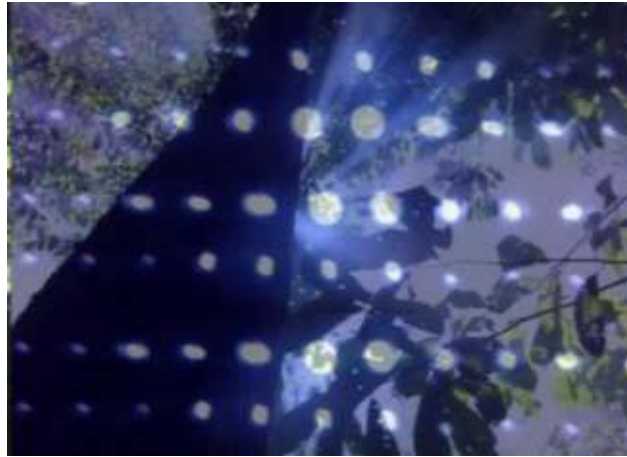


**Figure 9: Piracy Detected**

On insertion of IR LEDs at the rear and around the screen of the theater, the film playing on the screen becomes blur and scrambled which is unfit to watch when it is recorded using camera, as shown in fig 10. But when it is viewed with naked eyes video can be seen clearly without any disturbance, as in Figure 11.



**Figure 10: Normal Picture**



**Figure 11: Normal Picture after Placing IR Led Around Screen**

The most important aspiration of this work is to develop an anti-piracy system for Movies in the Cinema field. A exclusive Secret key is given to authorized person can watch live film. This prototype is implemented by means of LCD Screen, cluster of IR LED's. The complete model was assembling on the technology of embedded system which makes the arrangement secure, authentic and trouble-free to use.

## **V. CONCLUSION**

The proposed system is implemented to provide a scheme to prevent illegitimate video recording of movies in theatres using IR LEDs and concept of video steganography, as a result targeting the grey marketplace of piracy. The IR transmitters make the captured videos useless. The concept of video steganography hides the data inside number of frames of image, so it is further protected. Application of video steganography is more useful when compared with image steganography for the reason that the data will be hid inside number of frames of images so, it is more secured method to prevent the illegal recording of movies in theaters. IR transmitters used in the system are placed in and around the perimeter of the movie screen. The wavelengths of infrared are longer wavelengths than those visible to humans. This range of light is invisible to human eyes. It is very visible to many types of cameras.

Hence these lights would not disturb people watching the movie. It will however distort the recordings made by many types of cameras. Hence the captured content gets blurred, or disturbance is introduced in it.

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