

A Novel Approach to Develop a Movie Piracy Prevention System

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Abstract: *Movie piracy has a profound impact on the motion picture industry. These losses in revenue will obviously cause serious financial problems for the studios and even contribute to their current downfall. The aim of the project is to develop an anti-piracy system for movie industries using Steganography technique in MATLAB and to design IR based screen to disable mobile recording and alert system.*

Keywords: Steganography Technique, MATLAB

I. INTRODUCTION

This project describes a system where in IR signals are transmitted towards movie audiences in the theatres which will wash out any silicon-CCD (charge coupled devices) based digital camcorders, which makes the recorded video content unfit for illegal marketing. This procedure finds a camera and kills it. It utilizes picture handling for distinguishing camera's focal point or lens. IR lights will be coordinated to the focal point which will contort the picture by over exposure. The coordinated infrared light causes solid diminishment in the nature of the picture. It doesn't meddle with the camera's activity and it is innocuous to the camera client. The proposed work has applications, for example, forestalling robbery at movie theatres. This work will serve gainful at spots, for example, galleries, enterprises, authentic landmarks, displays, evolving rooms, shopping centers, gems stores, where keeping up mystery is a huge issue. A secure video steganography technique is to be developed in this project. Here modulo operator is used for hiding target string. The embedding as well as extracting process is of two steps which provides more robustness in this method. During pre-processing the hexadecimal equivalent of target string is calculated by taking four bits at a time. That increases capacity of cover media. Modulo operator is used during embedding and the adjustment is done in such a way so that the distortion becomes less which increases imperceptibility. The quality of experimental result is analysed by SNR and also compared with standard LSB and HLLAS technique. Bits per sample is also calculated which shows more efficiency of the proposed technique.

II. PROPOSED SYSTEM

In our project, we use the property of light which is not visible to naked eyes, but the one's cameras can pick up, only visible light can be detected by human eyes. But light rays like IR and UV cannot be seen by our eyes, but cameras easily pick images of them. So while projecting the picture shows in theatres, we send original visible rays that help us see in theatres as movies along with a mix of other invisible light beams. The innovation in our project lies in the design, where we use IR burst a transmitter which is inbuilt within the projector which sends high intensity of infrared rays along with the movie projection. This whole infrared blaster and projector acts as one whole system in sync. Thus, unlike the previous case where if the IR system may or may not be operational. As we focus on prevention of piracy in cine field, it is highly necessary that the system operates along with the movie played. Hence integrating the IR system with the projector helps us achieve this objective.

There are 3 objectives in proposed model:

- Designing Infra-red based Transmitter Screen to avoid mobile recording
- Steganography Technique to hide secret key to avoid piracy.
- GSM based immediate alert to concerned authority to alert about Piracy Position using GPS.

III. LITERATURE SURVEY

1) Design of IR based Image Processing Technique for Digital Camera Deactivation P. A. Dhulekar; Priyanka Aher; Yogita Khairnar IEEE 2016

In this paper, author propose another procedure for identifying and deactivating digital cameras in photography disallowed regions. This procedure will find a camera and after that kill it. It utilizes picture handling for distinguishing camera's focal point or lens. Subsequent to finding camera's focal point an infrared light will be coordinated towards that focal point which will contort the picture by overexposure. The coordinated infrared light causes solid diminishment in the nature of the picture. It doesn't meddle with camera's activity and it is innocuous to the camera client. The proposed work has applications, for example, forestalling robbery at theaters. This work will serve gainful at spots, for example, galleries, enterprises, authentic landmarks, displays, evolving rooms, shopping centers, gems stores where keeping up mystery is huge issue.

2) Piracy Prevention System for Movie Theatres and Auditoriums Abhigya Bhatnagar Ahire Vivek, Magar Pranjali3 IJIRS 2016

A standout amongst the most main strategies the movie privateers use to carry the film out of the theaters includes recording the film utilizing a camcorder or a top of the line cell phone with a decent quality camera. Henceforth it is important to build up a system that tends to this traditional method for motion picture robbery. This paper proposes an answer for this issue. The proposed system makes utilization of picture preparing procedures over a picture obtained from a camera mounted at a reasonable area over the movie theater screen. A comparable system can be utilized to ensure exclusivity of programs held in the theaters and the introduction lobbies.

3) Comparatives study of Various Techniques against Camcorder Piracy in Theater Nilesh Kumar Dubey ; Hardik Modi IEEE 2018

For the long decay the cinema industries are suffering from camcorder piracy due to that every year cinema industries are losing billions of dollars. Most important cause of piracy is camcorder piracy, in which pirates record the movie during playback in theater. DCI (Digital cinema Initiative) given many rule and regulation to protect from piracy but still it is increasing, reason is there is no concrete technical solution exist. In this paper various techniques that can be opted in future for fighting against the piracy is taken. There are two types of solution exist for the overcoming the piracy problem one is through deterring the pirate and other is not to let it be captured through camera. Watermarking is one way to deter pirates and watermark can be embedded in frames or audio of videos. Modulations techniques can be used to generate flicker that cannot be detected by HVS but create noise in camcorder recorded videos.

4) Comparatives study of Various Techniques against Camcorder Piracy in Theater Nilesh Kumar Dubey; Hardik Modi IEEE 2018

Nowadays, camcorder piracy has great impact on the motion picture industry. Although some watermarking technologies can track the movie pirate, the video content viewed in the theater may be affected and they cannot obstruct the need of pirated movie because the watermarks in pirated moves are invisible. This paper presents a new method to defeat camcorder piracy and realize content protection in the theater using a new paradigm of information display technology, called Temporal Psychovisual Modulation (TPVM), which utilizes the differences between the human-eye perception and digital camera image forming to stack an invisible pattern on digital screen and projector. The images formed in human vision are continuous integration of the light field, while discrete sampling is used in digital video acquisition which has "blackout" period in each sampling cycle.

Based on this difference, we can decompose a movie into a set of display frames with specific patterns and broadcast them out at high speed so that the audience cannot notice any disturbance, while the video frames captured by camcorder will contain highly objectionable artifacts (i.e., the patterns). The pattern embedded in the movies can also serves as tracking information to reveal the one responsibility for the camcorder piracy.

IV. METHODOLOGY

Methodology for Objective 1

- Video frames will be played by MATLAB powered video player. While playing video in section it will check for hidden key in video frames, in case key is matched it will allow for playing video.
- Else alert will be sent to the distributor with the location of person trying to run the video.

Methodology for Objective 2

- Steganography method is applied for master copy of video frames and permitted operator location.
- The details like password are hidden in video frames which are invisible for human eyes to avoid piracy.

Methodology for Objective 3

- The IR's are designed to sense the presence or absence of partitions such that lighting functions change to accommodate the appropriate size space, to avoid mobile recording

Methodology for Objective 4

- With this GSM Modem that can accept any GSM network, SIM card operator act just like a mobile phone with its own unique phone number.
- Concerned authority will receive an alert with its position by Receiver Global Positioning System (GPS), in case of piracy.

Algorithm for Embedding Secret message in Multimedia file:

- Step-1: Input cover Multimedia file, Secret message and Shared Secret key.
- Step-2: Break the Multimedia file into frames.
- Step-3: Convert the secret message into cipher text by using secret key shared by sender and receiver.
- Step-4: Find Least Significant Bits of each RGB pixels of the cover frame.
- Step-5: Convert the encrypted text message into bits.
- Step-6: Embed the bits of the secret message into bits of LSB of RGB pixels of the cover frame.
- Step-7: Continue the process until the message fully embedded into multimedia file.
- Step-8: Regenerate Multimedia file frames.

Algorithm for Extracting Secret message from Multimedia file:

- Step-1: Input stego Multimedia file.
- Step-2: Break the stego Multimedia file into frames.
- Step-3: Find and retrieve the LSB bits of each RGB pixels of the stego frame.
- Step-4: Continue the process until the message fully extracted from multimedia file.
- Step-5: using shared key decrypt message to get original data.
- Step-6: Reconstruct the secret information.
- Step-7: Regenerate Multimedia file frame

V. SYSTEM DESIGN

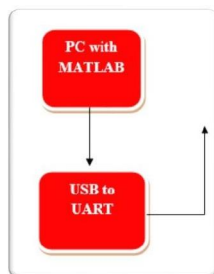


Fig. 1. Transmitter Section

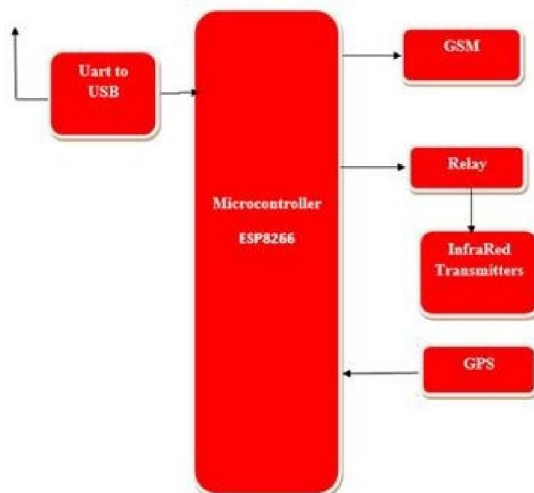


Fig. 2. Receiver Section

VI. CONCLUSION

This system is easy to implement. It can be used for detecting any kind of piracy and to track online videos to avoid illegal leakage. This system will have low cost, low power consumption and high accuracy. There can be various other applications of this system which requires high degree of piracy and security such as highly confidential conferences, meetings, research centers etc.

As a deterrent against camcorder piracy several watermarking techniques can be implemented. The main idea of this technique is to embed a imperceptible message (i.e, tracking information) into the movie. The message indicates the theatre to which the movie is being distributed, equipment on which it was shown, date and time of showing and information identifying the projectionist. If movies are pirated and illegal recordings are transmitted on Internet or via some other route, then the message can be extracted from the pirated movies to reveal the person or organization responsible for unauthorized release. As a forensic tool, tracking information gives the content, owner information to help manage the piracy problem and serves as the further surveillance and a deterrent to future piracy.

VII. FUTURE ENCHANCEMENT

The problems with this technique is overcome by another concept called as Temporal Psychovisual Modulation (TPVM) to track movie piracy. Digital camcorders cannot fully record all the optical signals emitted from the screen. Therefore, human eyes and semiconductor sensors apply different temporal convolution kernels to light sources when forming images. Based on this difference we can design optical signals in the way that human and pirating camcorders perceive drastically different images. The intriguing bifurcation can be realized by the recently proposed paradigm of information display technology called Temporal Psychovisual Modulation (TPVM) to track piracy.

REFERENCES

- [1]. Comparatives study of Various Techniques against Camcorder Piracy in Theater Nilesh Kumar Dubey; Hardik Modi 2018 4th International Conference on Computing Communication and Automation (ICCCA) Year: 2018 | Conference Paper | Publisher: IEEE
- [2]. Y Chen, G Zhai, Z Gao, Ke Gu, W Zhang, M Hu, J Liu “Movie Piracy Tracking using Temporal Psychovisual Modulation”, in IEEE conference 2017.
- [3]. J Bloom and C. Polyzois, “Watermarking to track motion picture theft,” in Signals, Systems and Computers, 2004. Conference Record of the Thirty-Eighth Asilomar Conference on, vol. 1, Nov 2004, pp. 363–367 Vol.1.
- [4]. B. NEWS, “The fact and fiction of camcorder piracy”, [Online].
- [5]. MEpstein and Stanton. “A method and device for preventing piracy of video material from theater screens”, Oct. 4, 2000, eP Patent App. EP19,990,923,789. [Online]. Available: <https://www.google.com/patents/EP1040655a2?cl=en> [6]
- [6]. Website “A GSM Technology” reference [Online].
- [7]. C Hu, G. Zhai, Z. Gao, and X. Min, “Information security display system based on spatial psychovisual modulation,” in 2014 IEEE International Conference on Multimedia and Expo (ICME), July 2014, pp. 1–4.
- [8]. US Patent “Movie Film Security System Utilizing Infrared Patterns reference”, [Online].