



INNOVATIVE PIRACY PREVENTION THROUGH INFRARED AND LSB VIDEO STEGANOGRAPHY.

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Abstract: This project presents an innovative solution to prevent movie piracy using an automated infrared transmitter and LSB video steganography method. An invisible light is projected from projector onto the theatre screen, disrupting camera functions and making illegal recording useless. The project also uses LSB video steganography technique is being utilized to conceal both the secret key and the theatre name for playing the movie, with a message sent to the authenticated person if a match is found and an alert for piracy detection if not. This solution addresses the impact of camcorder piracy on the motion picture industry and offers content protection in theatres.

1 INTRODUCTION

Movie piracy is a widespread problem for the motion picture industry, leading to financial losses for studios and contributing to their downfall. The most common method of piracy involves filming a movie inside a theater and uploading it online or selling it on the streets. Despite efforts by movie theaters to police and prosecute piracy, an anti-piracy screening system could be more effective in making pirate copies useless and having no impact on the audience.

Camcorder piracy is a significant source of piracy, accounting for about 23% of piracy methods. Copyright law protects the value of creative work, and making unauthorized copies can lead to civil and criminal liability. The MPAA conducted an investigation in 2005, revealing that major

U.S. motion picture studios lose 6:1 billion or more annually due to piracy. In 2010, over one million illegal downloads of James Cameron's Avatar were made in just seven days. Piracy is a significant problem for the motion picture industry, causing financial losses and contributing to studios' downfall. The most common method of piracy is to film a movie inside a theatre and upload it online or sell it on the streets. Movie theatres have tried to address piracy through policing and prosecution, but an anti-piracy screening system could be more effective. Camcorder piracy is a significant source of piracy, accounting for about 23% of piracy methods. Copyright law protects the value of creative work, and making unauthorized copies can lead to civil and criminal liability.

To address piracy, it is essential to protect the creative value of works and prevent financial losses for studios. An anti-piracy screening system could be implemented, along with other piracy prevention measures. This would make pirate copies useless and have no effect on the audience, potentially reducing financial losses and protecting the value of creative works.

2 PROBLEM STATEMENT

Cinema is a major entertainment for people in today's life. To entertain people a lot of investment is put on cinemas by the film – makers. Their effort is being ruined by few people by pirating the cinema content. They do it by capturing the video and upload it to websites or sell it to people and this goes on.

Film piracy has been the bane of the film industry for about 5 - 10 years now, slowly but surely it is starting to slowly deteriorate the way they sale and make their films. This effect is surely bad, it means

a rise in prices, a fall in quality and an abundance of crimes committed by thousands of people.

3 LITERATURE SURVEY

1.M.Epstein and Stanton. “A method and device for preventing piracy of video material from theater screens.” Oct. 4 2000: M.Epstein and Stanton proposed a system by locating the camera and projecting scanning light beam disturbs the camera sensors from illegal video capturing [4]. The shining objects reflect light which is transmitted from the screen, the target is detected and the camera sensors are saturated by scanning light beam. The disadvantage of the system is miss catch of the illegal recording camera that might be any other glittering objects (e.g. earrings, necklaces) also reflect light. Also scanning light affects human eyes by scanning eye spectacles and causes injury to human eyes.

2.a)M.Nailmark, “How to zap a camera: Using lasers to temporarily neutralized camera sensors. “,2002 M.Nailmark presented an idea based on spatiotemporal modulation of light beam. The idea is of introducing non-permanent aliasing artifact during captured movie creating irregularity between projected frequency and camera sampling frequency .This modulation system must be designed more carefully so that movie will not contain artifacts which are noticeable for viewers, unlikely disadvantage of this technique is the artifacts can be removed by using simple method of low pass filtering.

3.Zhongpai Gao, GuangtaoZhai, Xiaolin Wu, Xionguo Min, and chengZhi, “Dlp based anti- piracy display system,“2014.: The camera recording will be in discrete samples but the human perception of light will be in continuous form, by making use of this idea TPMV system is designed to block out the camera recording. Disadvantage of the system is which causes the rainbow effect. Fortunately, not everyone see the rainbows.

4.C.R Odgers : “Method for spoiling copies of theoretical motion pictures made using a video camera and recorded, “Int.Patent WO 04/095 200, Dec 16,2004.:

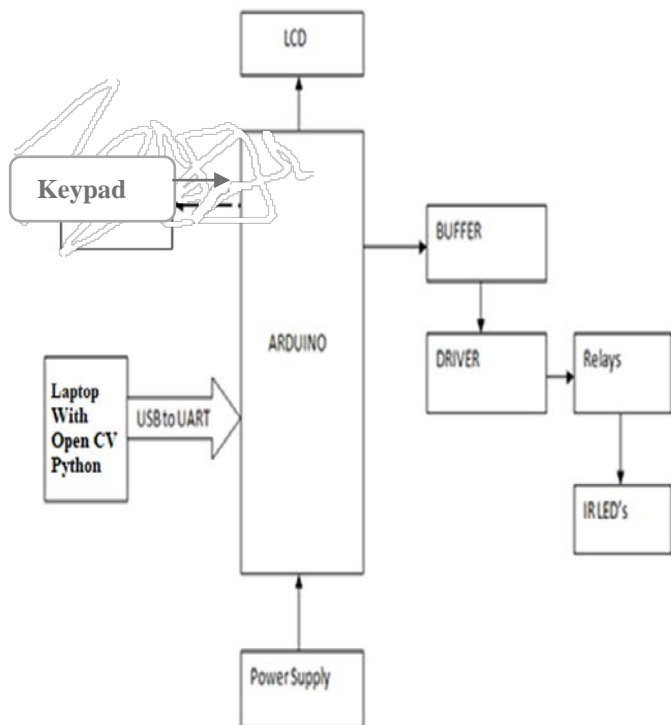
Odgers and Christopher. R presented a method to spoil copies of motion pictures

that were being recorded using a video camera[2]. In movie house or similar installation for projecting still or moving normal visible images. When a camcorder is used to record the screen to make illegal copies of normal visible images, light sensitive elements of camcorder convert the invisible spoiling image into a corresponding normal visible image and thereby spoiling it.

5.A. Taylor CCD and CMOS imaging array technologies-Technology review, “”Xerox Research Center Europe, Tech. Rep. EPC-1998-106,1998,pp. :

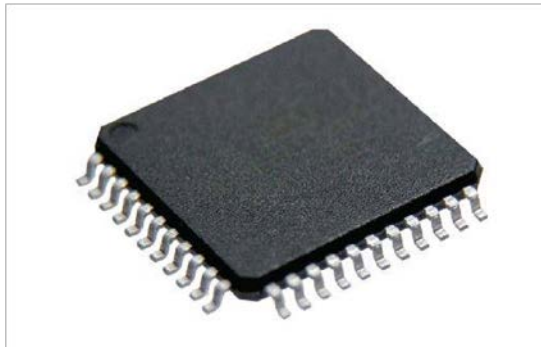
A Taylor represented an overview of how CCD and CMOS imaging array techniques are being used to avoid piracy[3]. CCDs are being extensively used for nearly 30 years and the technology has matured to the point where very large consistent devices can now be produced. CCDs suffer from a number of drawbacks, including cost, complex power supplies and support electronics. CMOS imaging arrays, are still in their infancy. This review provides an overview of both CCD and CMOS imaging technology, and includes explanations of how images are captured and read out using imaging arrays. Also covered are issues such as performance characteristics, cost considerations and future of imaging arrays. This review does not provide details of cover sensors, color filter arrays, color interpolations, etc., as these will be a subject of a separate report.

4 METHODOLOGY



The description of the Proposed System is explained below.

I. MICRO CONTROLLER



The LPC2141/42/44/46/fortyeight microcontrollers are primarily based totally definitely totally on a 16-bit/32-bit ARM7TDMI-S CPU with real-time emulation and embedded traceSupport, that integrate microcontroller with embedded excessive pace flash reminiscence starting from 32 kB to 512 kB.A 128-bit wide memory interface and a unique accelerator architecture enables 32-bit code execution at the maximum clock rate. For vital code length applications, the opportunity 16-bit Thumb mode reduces code through greater than 30 % with minimum overall performance penalty.

II. POWER SUPPLY

This project is designed to run on a 9V battery source. It is expected to deliver the necessary voltage level needed by the microcontroller and the other devices. These devices required a 5V supply instead of the 9V, hence the need for a voltage regulator. The LM7805 chip is used to regulate the 9v to 5V supply for the whole design. The 9V battery source is regulated to a 5V by a voltage regulator. The capacitor is used to increase the transient response off the regulator.

III. LIQUID CRYSTAL DISPLAY(LCD)



A liquid crystal display (LCD) is a thin, flat panel used for displaying information such as text, images, and videos. It is lightweight, portable, and can be produced in larger screen sizes than traditional cathode ray tube (CRT) displays. LCDs are electronically-modulated optical devices made up of pixels filled with liquid crystals and arrayed in front of a backlight or reflector to produce images in color or monochrome. The discovery of liquid crystals in 1888 led to the development of LCD technology. By 2008, worldwide sales of televisions with LCD screens surpassed the sale of CRT units.

Each pixel of an LCD consists of a layer of molecules between two transparent electrodes and two polarizing filters. The transmission axes of the polarizing filters are typically perpendicular to each other. Without liquid crystals between the polarizing filters, light passing through the first filter would be blocked by the second filter. The LCD's low electrical power consumption makes it suitable for battery-powered electronic devices such as calculators, watches, and telephones

IV. IR Transmitter

The purpose of the transmitter is todistrupt the camcorder from recording, however these lights would not disturb the people watching the movie. The IR LED works between 1.6V-3.3V. IR wavelength ranges between 750nm-2500nm. The wavelengths of infrared lights have longer wavelengths than those visible to humans. This range of light is invisible to the human eye .It is very visible however to many times of cameras.

V. RELAY



Relays are electro mechanical switches which are used to control several IR LEDs. It works on electromagnetic phenomenon. It switches between different loads. It switches between the terminals depending on the potential difference. They can be driven by a low power signal. It takes 12V for its operation.

VI. Keypad



A 4x4 Keypad as shown in above fig is used in this system in order to input the password from user during authentication phase. It has 16 buttons for human interface. These are connected to microcontroller using input/output pins.

VII. LSB VIDEO STEGANOGRAPHY

Video steganography is the process of hiding secret data in a video file by embedding it in the frames. It combines techniques from image and audio steganography, as a video file is a collection of images and sounds. The advantages of video steganography include the large amount of data that can be hidden and the fact that it is a moving stream of images and sounds. The secret data is embedded in the frames as payload.

Algorithm for Embedding:

- Step 1: read the text and image file
- Step 2: resize that image into the size of the cover video.
- Step 3: divided the images into bit-slicing method.
- Step 4: input the cover video
- Step 5: split that video into frames
- Step 6: select 8 frames where a bit sliced image will be embedded.
- Step 7: find that LSB bit of the cover frames.
- Step 8: embed those bit planes into that image frames and return those frames into its previous position.
- Step 9: regenerate video frames.

Algorithm For Extraction:

- Step 1: input the stego video
- Step 2: extract frames from the video
- Step 3: find those frames by the specified key
- Step 4: find LSB of those frames.

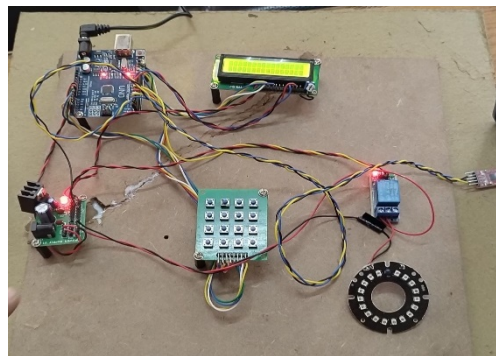
- Step 5: extract those bits from those stego frames.
- Step 6: merge those bits to form the final image.
- Step 7: Extract the Dual Encrypted Text from Image

Working:

During the process of embedding the video that has to be played is taken as input and we are hiding the theatre name along with its location. While extracting the same the authorized person is asked to enter the secret key with the help of keypad .If the key matches the video is played on the theatre and the IR transmitter is turned On to stoop the camcorder from recording. On Unsuccessful match the message to the concerned authority is sent about the piracy location.

5. RESULT

The hardware setup of the block diagram of the movie piracy system as shown in below Fig.



6. CONCLUSION

If any other person other than the theatre owner, the system considers them as an unauthorized person. Hence does not allow the movie to be played in the theatre. An alert message is sent to the concerned person or to the theatre owner displaying that an unauthorized person tried to play the movie along with the place where it was tried to be played .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.

7. FUTURE SCOPE

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.

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