

# Digital Camera Deactivation By Using IR Based Image Processing Technique

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## ABSTRACT

We develop a new technique for detecting and deactivating digital cameras, mobile cameras in photography restricted places. This technique will find a camera and then make it non working. Image processing is used for detecting camera's lens. After finding camera lens an infrared light will be directed towards that lens which will distort the image by overexposure. The direct IR light causes strong reduction in the quality of the image. It does not interfere with camera's operation and it is not harmful to the camera user. This paper has applications such as preventing piracy at theaters. This process will use at places such as museums, industries, historical monuments, exhibitions, changing rooms, shopping malls, jewelry stores where maintaining secrecy is big issue.

**Keywords :** IR light, Security, Web Camera, Image Processing, Raspberry Pi 3, Servomechanism, E. IR-Transmitter, Strong Light Source

## I. INTRODUCTION

Using cameras is prohibited in museums, historical monuments, temples, user tend to capture images of these sites secretly, which is not significant. Considering the Piracy at theatres, Indian film industry suffers heavy losses due to it. To deals such problems, there is a need to develop a system which will detect any digital camera and then neutralize image or video taken by that camera.

Film industry also suffers loss due to movie Piracy. Hence, there is a need to prevent this undesired use of cameras, to avoid this heavy loss. The solution is based on detecting the camera's that are capturing pictures of the site. By avoid photography ensures the gift shop maintain a monopoly on selling images.

Banning photography in believes to boost security by preventing thieves and terrorists from visually capturing images in defence areas.

The problem of hidden camera at open areas is extremely foremost nowadays. These cameras are covertly placed up in evolving rooms, theatres and numerous different spots which represent a noteworthy risk to the protection of individuals. Movies and videos appears when they are discharged are recorded and set up for open utilize route before the real legitimate disks are made accessible in the market prompting immense misfortune for the genuine proprietors who don't get their offer of the advantage. This task means to help in keeping up the wellbeing and security of individuals by building up an application with the assistance of which spy cameras can undoubtedly be identified. Likewise this undertaking discovers its application in courts and places where cameras are not permitted. A few people may contend that cameras are anything but difficult to discover and this proposition is in this way pointless, however hunting down undercover cameras is no less demanding an occupation. Physically checking their quality is relatively inconceivable, this framework

will discover its application at such places to somehow be explore.

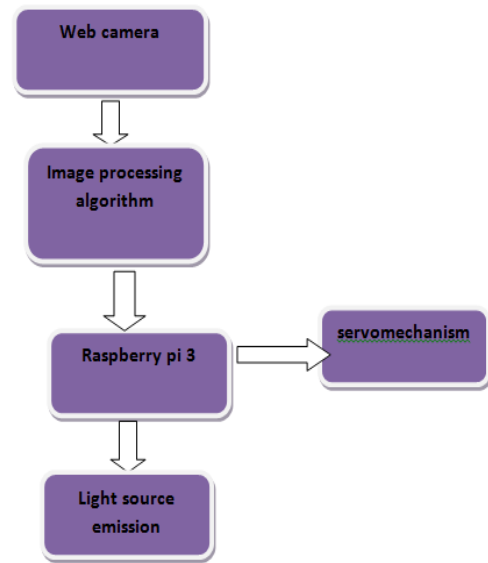
## II. SYSTEM DESIGN

This technique aims at designing a technique for detecting and deactivating digital cameras in photography prohibited areas based on image processing. The system will consist of two parts: Camera detection unit and Camera deactivating unit. Camera detection unit includes web camera interfaces with personal computer. Web cam will be used to capture the images of prohibited area.

The position of the camera lenses will be detected by identifying and tracking distinct features of the lens. An algorithm which is used for the detection of camera lens will be written in any image processing software like MATLAB. direction of the lens of camera will be monitored by referring its axis value as defined in image processing software.

Second part is camera deactivating part which consists of Raspberry pi 3, IR transmitter and servomechanism. Control signal from camera detection part will be generated and sent through serial communication to Raspberry pi 3. IR light transmitter will be used to reduces the quality of the captured photo.

Infrared light transmitter will be well set on to the servomechanism. This mechanism will be interfaces with Raspberry pi 3 module. After detection of camera lens and its position a signal will be sent to Raspberry pi 3 board and board will operate servom mechanism such that IR transmitter will point in the direction of detected lens and emit strong IR lighjt rays which will reduce the quality of captured photo. The total number of lenses can be counted by using objects counting algorithm based on raspberry pi and image processing tool on real time basis.



### A. Web Camera:

The first stage of any vision system is an image acquisition tool. Web camera will be used as an image acquisition device for capturing images in photography prohibited area. This camera will be interfaced with computer or PC via image acquisition toolbox in MATLAB. The image capturing toolbox enables modes such as processing in loops, hardware triggering, background acquisition ,etc. The obtained data will be in the form of video or various segments of images. The video will be segmented into number of frames for further processing.

### B. Image Processing Algorithms:

After capturing the images from the web camera, position of lens and be monitored by identifying the distinct features of the camera lens. This can be done by using different type of image processing algorithm tool using MATLAB software.

### C. Raspberry Pi 3:

Image processing software that is MATLAB tool identifies the mobile camera lens and generates control signal. The control signal will be sent to the Raspberry pi 3 to control the servomechanism movement.

#### D. Servomechanism :

Servomechanism will done as per the control signals received by the Raspberry pi 3 module. Servomechanism controls the position of IR transmitter. It contains the servomotors interfaced with the Raspberry pi 3 board so that IR light transmitter can point in each and every direction.

#### E. IR- Transmitter or Strong Light Source:

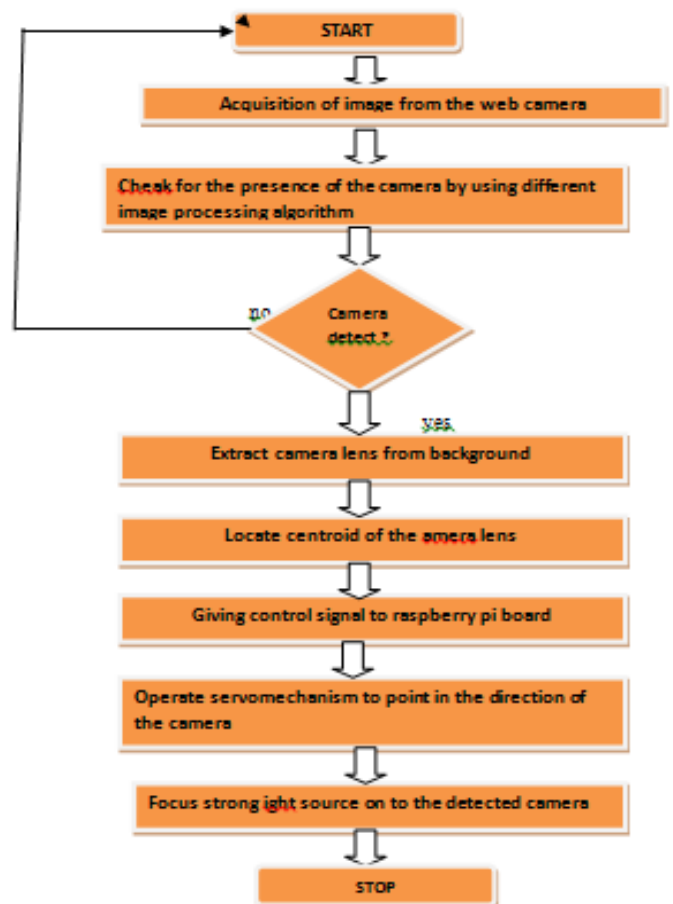
IR light transmitter plays an important role in the camera disabling part. With the control of servomechanism IR ray transmitter point to the position of camera and it will reduces the quality of captured picture.

### III. METHODOLOGY

We propose a new method for the problems of digital camera identification from its captured images based on the sensor's pattern noise. The process of camera tracking is based on image processing algorithms. Camera is used an image acquisition tool. This camera can be a USB camera or built in camera of PC. Command `imqaqhwinfo` in MATLAB can be used to get the details of the hardware interfaced with it . It is possible to detect multiple cameras by tracking camera lens. For circular lens detection algorithm based on Helmholtz perception principle can be used.Using this algorithm multiple circular camera lenses can be tracked . This process can be divided in following parts: A. picture acquisition The first step is to get a video feed from the camera connected to the computer. This video is then converted into sequence of frames or in segmented form. These frames will undergo further image processing algorithms Block Diagram Detection of Camera Detection of objects having circular shapes in digital images is important for image analysis in various computer vision applications.

This circular object detection method can be used for detection of circular shape of camera lens. An

algorithm for detection of camera lens will be written in any image processing software like MATLAB. Algorithm will include identifying circular lens from the images and captured video and the locating position of the lens. Locating Camera Position of the lens of camera in the area can be detect by referring its axis values. Depending on axis values a control signal will be generated and sent to Raspberry pi 3 for further operation. Neutralizing detected Camera Servomechanism will be interfaced with Raspberry pi 3. An IR- transmitter will be mounted on to servomechanism. Servomechanism and IR-transmitters will operate as per signals from Raspberry pi 3 . IR light transmitters can also be replaced with strong light source. Use of Strong light source or IR light source is to reduce the quality of image by over exposure to light.



#### IV. CONCLUSION

The principle goal of this seminar is to plan IR based picture preparing procedure for digital camera deactivation in photography prohibited region. This system will find the large number of cameras by using picture preparing calculations. The recognized cameras will be deactivated utilizing IR light transmitters. This work will be useful in the zones, for example, theatres for counteractive action of robbery. It has good applications which incorporate keeping up mystery at resistance territories, enterprises, innovative work centers, religious regions, adornments stores, changing rooms at shopping malls.

This system is used to detection of the digital camera in the photography prohibited area. By using different types of image processing algorithms, position of camera lens is calculated. There are two different image processing algorithms, first is based on the Circular Hough Transform and other is based on the Retro-Reflection property. The Raspberry Pi 3 board gives control signal to the user gets the distorted picture.

This system provides many applications such as for preventing piracy at the movie theaters, the areas where maintaining secrecy is important such as in museums, god temples, Shopping malls, jewelry stores etc.

#### V. REFERENCES

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