Smart Security Camera using Raspberry PI

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Abstract:- **Wireless security is the prevention of unauthorized access or damage to something. Surveillance is most important security systems in home, industrial, office and public places. In this security system is based on IOT (internet of things). The human movement is detected using the software OPENCV. As soon as somebody is detected it sends an email to owner. When the protection system is activated, the CCTV camera is activated. This extremely reactive approach has low procedure demand. thus it's similar temperament for home closed-circuit television. This closed-circuit television is enforced mistreatment raspberry pi , camera.**

Keywords:- *Raspberry pi ; CCTV ; IOT ; Camera.*

I. INTRODUCTION

Surveillance is most significant field in security system. Security Camera is that the observance of the behavior , activities, or alternative ever-changing data, sometimes of individuals for the aim of influencing, managing, directing, or protective them. Security Camera systems square measure routinely utilized in home, office or vehicle observance and image identification, however this technique needs a high performance core, that works against some benefits of embedded systems, like low power consumption and low value. Wireless security is that the hindrance of unauthorized access or secure to MOBILE victimization wireless networks Systematic resolution for home[1].

Safety of commodities is one of the burning issues in today's world. CCTV surveillance is a widespread precaution employed to provide mitigation against danger or threats. However, the Closed-Circuit Television(CCTV)[2] suffers from several drawbacks such as obscure pictures, ability to classify moving objects and lack smartness in general apart from a substantial burden on storage spaces and costlier hardware implementation. With rapid advancements in technology, we aim to cascade newer technology to our conventional problem of security. We aim to use the video feed from CCTV in conjunction with an object detection methodology and provide real-time protection. The software receives input from camera, processes and then analyses the data in order to find inconsistencies[1]

The aim of this project is to analyze a price effective answer that may offer dominant of home appliances remotely and can conjointly modify home security against intrusion within the absence of home owner. This system uses wi-fi access to ensure security.[4]

II. MOTIVATION

The use of M2M (machine to machine) communication is academic degree advantage over the conventional data Acquisition System (DAS) because the look and dominant is also relinquished human intervention. as a result of the system becomes whole automatic that the number of error decreases and also the efficiency of the system will increase drastically.

III. LITERATURE SURVEY

In literature AN IOT based mostly system and its blessings are explained that uses email notification and cloud to store information[4], literature mentioned regarding remote image information transfer to mechanical man device with wireless computer network however with restricted distance constrain.[4]

The limitation of CCTV cameras is mentioned in whereas the important time systems offer AN immediate response for crime detection and the bar. The main principle of network remote video police investigation system primarily based on embedded system as mentioned in literature is to line[6] AN embedded net server at the video police investigation terminal. The video signal ought to be digitized first, then compressed by the high compression chip and finally is sent to the built-in web server[2].

IV. CURRENT FUNCTIONING MODEL

Security and crime management issues square measure the motivating factors for the preparation of video surveillance cameras. Closed -circuit tv (CCTV) is that the use of video cameras to transmit a sign to a selected place, on a restricted set of monitors. this method simply uses the cameras to try to surveillance. This system just records the what is happening around the camera. Usually after any incident happens we look at the CCTV footage after some period of time.

V. PROBLEM IN CURRENT MODEL

A. Privacy Issue

There have been a few instances in the past that huge number of surveillance cameras were attacked by hackers. Also, there have been cases where employees have objected to

being under constant surveillance without their permission and citing the 'invasion of privacy' as the reason.[3]

B. They can be Vulnerable

A clever interloper can most likely recognize all regarding them and should have worked out the way to travel unobserved.[3] Further, tech-savvy criminals might need understood the technology and discovered ways that to disable/disconnect them from their power supply.

C. Can't stop Theft or Crime

Cameras enable users to record footage for later viewing, and to help nab criminals, and receive justice from the law. They cannot, however, stop a crime when it is in progress. It will just record the whatever is happening it won't tell us at that particular moment.[1]

VI. PROPOSED SYSTEM

The aim is to make a smart surveillance system using Raspberry Pi and Raspberry Pi-Camera. OpenCV is used to detect the motion whenever someone comes within its range it detects the motion, Pi-Camera activates and captures an image. This image is then stored in the system and finds for a human face in the captured image using Open CV and Python. The detected human face is then captured. This is done through using the cascading files in the XML format. So we use these cascading files and see whether is there any person or not. There are different types of cascading file for different purposes, eg:- full body cascading file , upper body cascading file , face cascading file. Once a image is captured using these cascading files we mark an outline according to whichever cascading model we have used. Then if there is any moment then an image is captured, After that image is generated and the boundary is marked around the face or body according to model which has been used then is Emailed to the User, on his android mobile phone via mail. In this way, this system helps to identify only unauthorized persons. This helps to overcome the drawback of CCTV and Motion Detection systems which only monitor or alert host based on the motion detected whether it is authorized person or not.
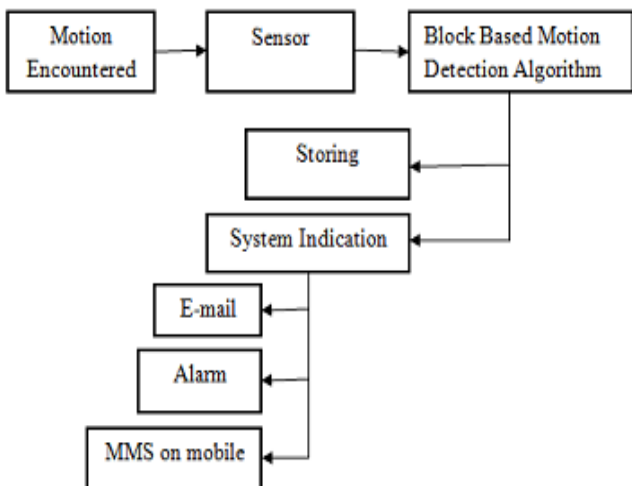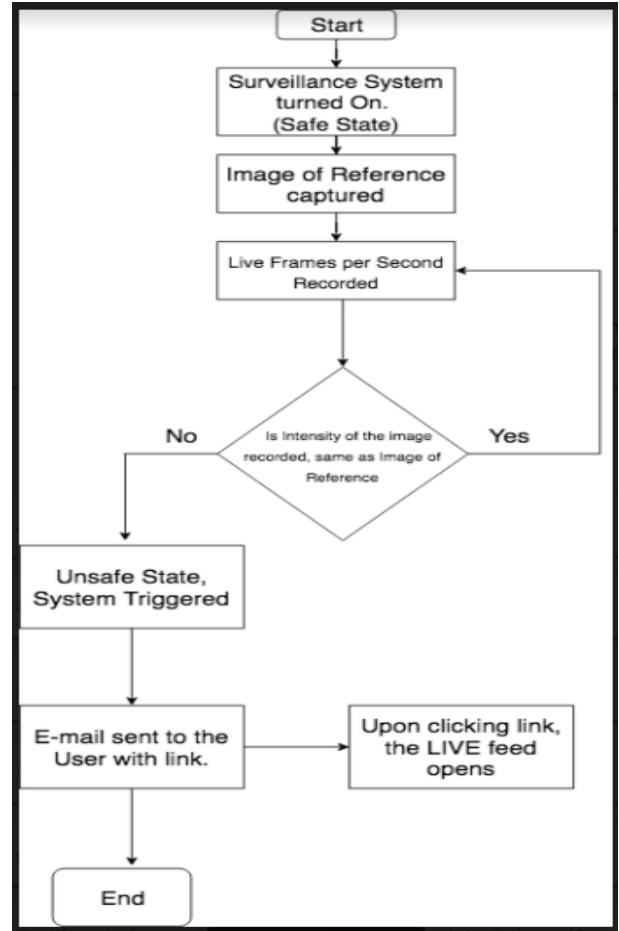

Fig 1:- Block diagram of working model.

Fig 2:- flowchart of working model

VII. CODE

This project uses a Raspberry Pi Camera to stream video. Before running the code, make sure to configure the Raspberry Pi camera on your device.

Steps to run the code

- Open the terminal and run
  "sudo raspi-config"
  Select Interface Options , then Pi Camera and toggle on. Press Finish and exit.

- You can verify that the camera works by running
  "raspistill -o test.jpg"
  It will save a image from your camera in your current directory names as test,jpg.

- The project uses OpenCV to detect the images from the live feed so we need to install that and create a virtual environment for running our code.

- By typing these commands we will enter into
  " source ~/.profile"
  "workon cv"

- To get emails when objects are detected, you'll need to make a couple modifications to the mail.py file.

Open mail.py with vim vim mail.py , then press i to edit. Scroll down to the following section

fromEmail = 'myemail@gmail.com'
fromEmailPassword = 'password1234'
# Email you want to send the update to
toEmail = 'anotheremail@gmail.com'

- Run the program
  "python main.py"

➢ *Receiving Emails*
When receiving an email for the first time, you might get the following notification from Google:
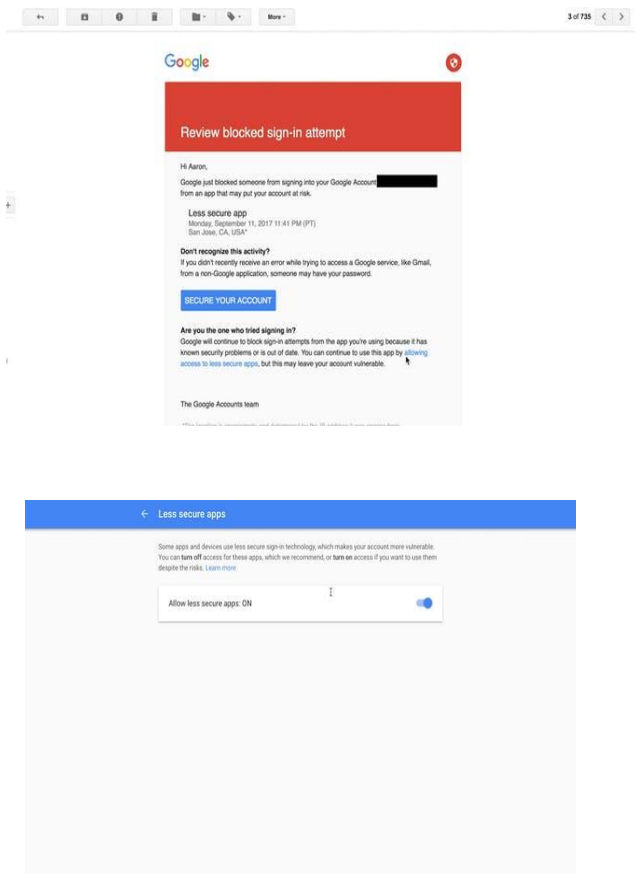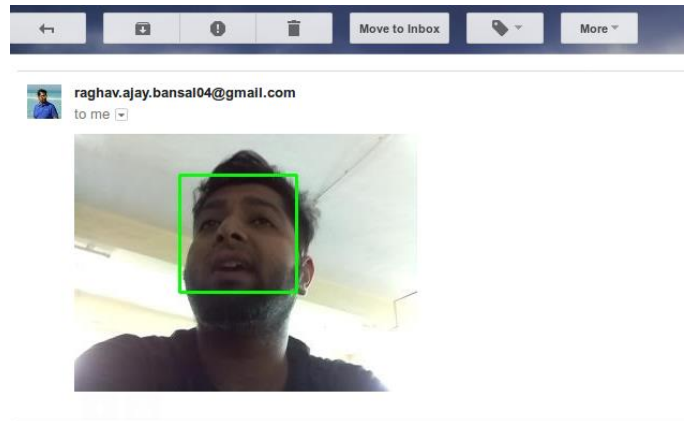
By default, Google blocks apps from using SMTP without permissions. We can solve this by clicking on the allow "less secure apps" link and toggle the feature on. The next object detected will send an email.

➢ *Snapshots of the Email*
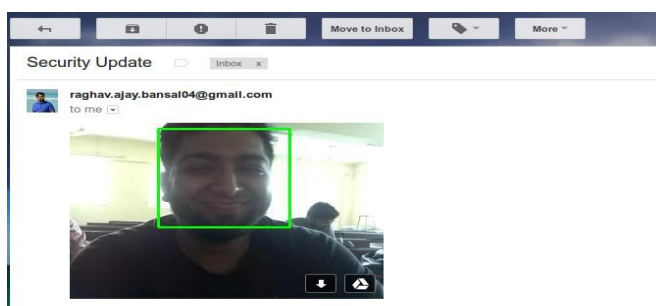
VIII. CONCLUSION

In this project we have successful created a Smart Security Camera using the Internet Of Things (IOT). HD

Surveillance Camera is set up in the area which we want to monitor, video containing detected motion is detected and live video can be accessed from anywhere just by entering the static IP assigned to the System in a web browser. Another welfare point for the user is that, the proposed system is extremely portable making it easily installable at any desired location without any constraints of wire fittings and system compatibility. In conclusion, the proposed system is the by-product of the comprehended constraints faced by the users, and now they can have what they desired for in the same price and less maintenance, thus ensuring their welfare.

REFERENCES

[1]. "Surveillance and monitoring system using Raspberry pi" published in Green Computing and Internet of Things (ICGCIoT), 2015 International Conference on Oct'16.
[2]. "Low-cost real time System monitoring" published by Ubiquitous and Future Networks (ICUFN), 2015 Seventh International Conference on August'17.
[3]. "Security System using Raspberry pi" published by Science Technology Engineering & Management (ICONSTEM), 2017 Third International Conference on Jan'18.
[4]. "X. Cai, F.H. Ali, And E. Stipidis, "Mpeg4 Over Local Area Mobile Surveillance System", 2002."
[5]. "Tasleem Mandrupkar, Manisha Kumari, Rupali Mane, "Smart Video Security Surveillance with Mobile Remote Control ", International Journal of Advanced Research in Computer Science and Software Engineering 2013."
[6]. "Internet of Things', 2012 Second International Conference on Instrumentation, Measurement, Computer, Communication and Control, 2012."