Home Surveillance System

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Abstract— Our proposed project, Home Surveillance System includes, Home Surveillance System using Raspberry Pi and Webcam. Surveillance is becoming a need in any public or private area to cope up with increasing number of threats starting from burglary, robbery to terrorist activities. The traditional methods for monitoring are commonly confined in the use of webcam or wireless sensor network (WSN). These two techniques serve the purpose in different ways. Webcam help in visual monitoring of target area whereas Raspberry Pi helps in processing image captured by Raspberry Pi from the environment. In this project we incorporate advantages of both technologies to build up a smart surveillance system. We have proposed a home surveillance system based on internet of things domain that identifies movement of human beings in target area and keep the visual evidence of the movement with the help of the camera by sending the alert message on the android application of the owner's mobile phone. This is an event based system, thus, substitutes the need for continuous monitoring of the area. A prototype application is deployed in locker room of home to evaluate some preliminary functionalities of the application.

I. INTRODUCTION

This IoT project focuses on building a smart wireless home security system which sends alerts to the owner. Applications ranging from smart governance, smart education, smart agriculture, smart health care, smart homes etc. can use IoT for effective delivery of services without manual intervention in a more effective manner. The same can also be utilized for home automation by making use of the same set of sensors. The leverage obtained by preferring this system over the similar kinds of existing systems is that the alerts and the status sent by the Wifi connected microcontroller managed system can be received by the user on his phone from any distance irrespective of whether his mobile phone is connected to the internet.

New technologies and new devices are now considerably reducing human efforts, the devices can respond to physical stimuli like motions, lights, air conditions etc. The home surveillance system is useful to reduce the possibilities of robbery and other criminal activities.

This system provides security to home owners. Here we propose a system comprising Raspberry Pi and web camera network. When the particular intruder will try to enter into the home then the camera will take a snap of person who enters into Surveillance area and notify the owner of the house with an alert message on a mobile application.

However, surveillance system using camera or Raspberry Pi is very common method practiced over years. The system is also getting modernized with the advancement of technologies, devices. Some system suffers from drawbacks like generating false alarm due to environmental interferences, reduced picture clarity during night and cloudy conditions, inefficiency in identification or classification of intruder, expensive and power scavenging, difficulty in detecting the presence of metallic objects and need for continuous human intervention. Here we propose architecture for surveillance comprising Raspberry Pi and cameras. The Raspberry Pi is used for image processing and the camera is a good support for actually monitoring the surveillance area remotely.

The main idea of this application system is to monitor an indoor area. Therefore, web camera has to be deployed at some strategic positions of the surveillance area. Whenever some movement (we have considered human movement only) occurs in the vicinity of a web cam, that web cam will detect the presence of a person.

The Raspberry pi will notify the owner of the house about the occurrence of the movement. The main system will immediately trigger the corresponding webcam to capture the current snapshot of the target area on the mobile phone of the owner through internet.

A user can take action on this unauthorized access as soon as possible in site of not being present on the site. Mobile application interface is designed, that will provide movement notification with detailed information like snap of the house

The web camera will take the snapshot of the intruder. Then it will send the image to the raspberry pi. The raspberry pi will process the image that is, convert the image into a string and encode it. Then the raspberry pi will send the image to the database. The image will be stored on the database for 24 hours. The images will be captured one after the other within the time interval of 5 seconds so that the movement is detected. The person using android pone has o click the start service button provided in he android app. When he service is started by the user, the android application will check for the data on the database. If it finds the images, it will send the notification of alert message. As soon as the user clicks on the notification, he will be able to see the captured images in the target area.

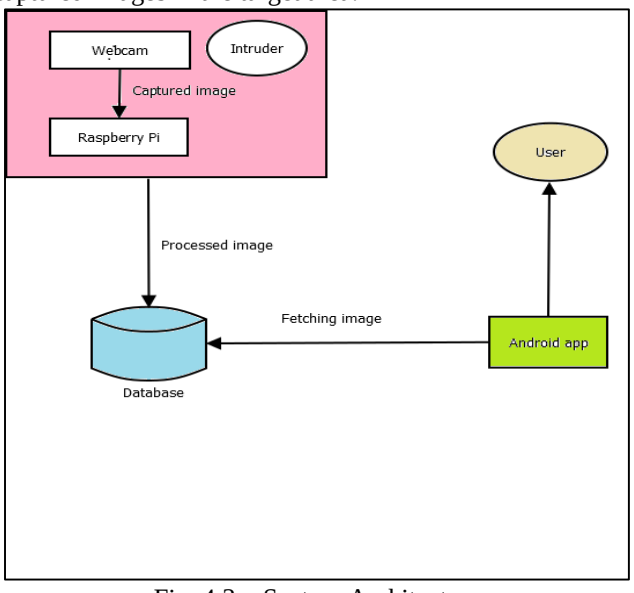

Fig. 4.3. : System Architecture

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The project uses two PHP files. One PHP file is of intruder side file. It contains the image in the string format and one Boolean variable which indicates the existence of the intruder. Initially the variable is 0 and when the intruder is detected, the variable becomes 1. This PHP file is used to transfer data from raspberry pi to database. The other PHP file is android side php file. This php file is used to retrieve the data from the database . After sending the notification the android resets the Boolean variable to 0.

The size of the system can be made very compact. This will help to install the system in such a way that the intruder could not see it. Complete video streaming of the activities taking place in the house. A multiuser system can be created by owning a domain and allowing multiple users to access it via their own login ids and passwords.

II. CONCLUSION

We introduced a Home Surveillance System that uses IOT technology to provide home security for the users.Our approach is real time implementation of various network components.

Home Surveillance System was able to successfully capture the images of the intruder and notify it to the user using android application. The deployment of Webcam along with Raspberry Pi not only enhances the overall system, it also opens up new dimension for improving the system.

The system is affordable to more people and works and battery and hence can be placed according to the convenience. Also, positions can be changed whenever required.

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