Embedded Based Office Security and Surveillance System

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Abstract- **Security and surveillance systems play a vital role in controlling the crime rate. For efficient monitoring, smart security systems are implemented which identifies the intruder immediately. Our idea is to broach man-less security and surveillance and intimate the owner using wireless communication. This aims to facilitate remote access and monitoring of the owner's premise and has a major advantage of taking instant action over the intruder. This setup can be spawned through Raspberry Pi controller interfaced with Motion Sensor (PIR) which is triggered when the motion is deducted. The controller activates the camera, which in turn captures the images of an unauthorized person and sends it to the user via GSM and mobile application with the help of Wi-Fi. Thus the owner is provided with the remote monitoring of his premise.**

Index Terms- **Security, surveillance, Raspberry Pi**

I. INTRODUCTION

The Embedded based office security and surveillance system is a model designed to reduce the manpower in remote monitoring. It increases the usage of mobile technology to provide essential security features to offices ensuring the safety and security. The existing methodology provides no effective instant action taken over the intruder. Besides, the user is also possible to identify the captured image through database system in real time. With the implementation of this system, the security system can be improved to a higher level. A majority of place owners simply do not have surplus funds to pay for a professionally installed security system. The use of this Alert System in this paper is affordable and easy to install.

II. LITERATURE REVIEW

According to the literature research, the common parameters or characteristics of office security systems are ceaseless monitoring of intruders, ease of use, reliability, operative, fast and pinpoint notification system. Today plethora of home security systems is available in the market, which authenticates to keep homes safe and secure. [1] Design and development of a House Mobile Security System propose the idea to avoid the entry of intruders if any into the house and to make the owner attentive via android phone, in the case the house be opened or made to open illegally. It includes automatic open/close of the front door controlled by the ATMEL controller for the owner. It also alarms when a vibration is hinted. [2] A Multilevel Home Security System, this paper deals with sensing the motion of a person using sensors and it has a break-in camera to capture the images done by PIC controller. The owner is informed through GSM. Since it has implemented RFID, the system has scanning and security issues like stealing of ID and password. [4] Home security system based on PIC microcontroller, this setup is controlled by PIC18F452 and it notably monitors the doors and windows of the premise and avoids robberies. An alarm is set up and sends a signal to the police station. This is a useful methodology that the data is sent to police so that they can immediately reach the residence directly.

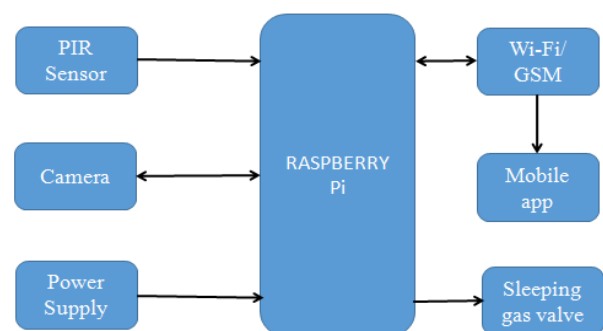## III. SYSTEM ARCHITECTURE

A. Proposed System

Fig: 1 Block Diagram

Office security and surveillance schematic can be procreated through Raspberry Pi microcontroller by interfacing sensor, camera and Wi-Fi module with help of hardware setup. Initially, the PIR sensor will be in the passive state. The PIR sensor deducts the motion through the infrared light emitted from warm objects. When the motion is sensed, it outputs digital High voltage. This output voltage triggers the microcontroller from its sleep state which in turn drives the Pi camera. Once the camera receives its signal, it will start to capture the images of the intruder. The data will be stored in the controller and it gets transmitted to the owner through GSM and mobile application developed on his android phone with the help of Wi-Fi technology.

At the same time, the controller signals the sleeping gas valve to open. This ensures that the pincher is not escaping from the demesne until the owner reaches the place of the illegal happening. By this proposal, not only the remote monitoring of the place is provided to the user but also this area is secured till he comes and takes action over the concerned person.
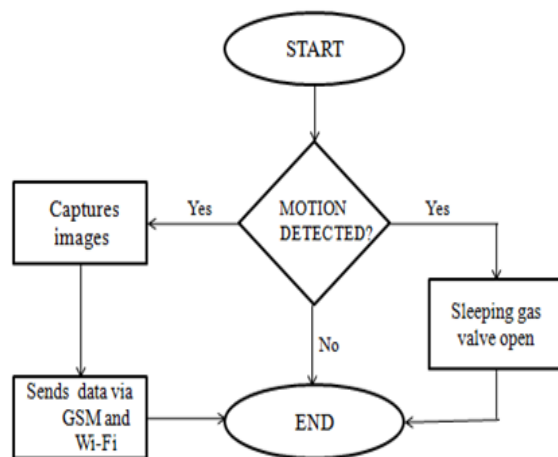
B. System Design

Fig: 2 Flowcharts

The flowchart depicts the working of the proposed system. It detects the motion around it and sends an alert message as a warning to the user and also intimates by sending of images through android app.

If the motion is not sensed, then the controller will be passive and waits for the movement which is acquired with the help of PIR sensor. Once the data is transmitted to the user, the system will again wait for next input (motion). The system is also capable of

opening the sleeping gas valve which will be activated by the controller. After it finishes all its specified operation, the system will tend to be passive.

IV. RESULTS

The devised system collects the real-time data from the sensor and put it on to the cloud from where it can be accessible by the owner using his android application and also through SMS.
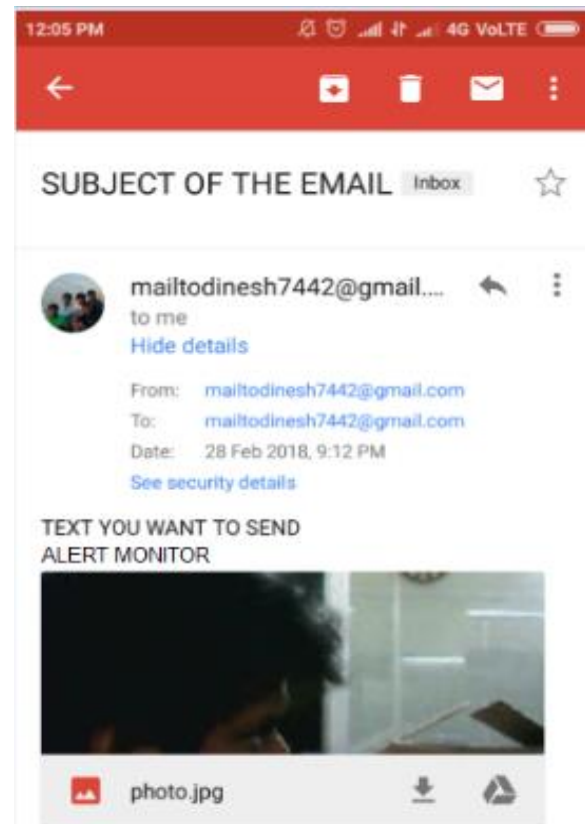
Result 1: SMS and Email Alerts

Fig: 3 Email Alert to the user

The output section coheres of two parts; the first section serves for the purpose of acquainting the user with the intrusion alert through GSM and android app and the section is meant for taking swift action over the pincher. Thus the user can monitor his place from anywhere and anytime and also he can take charge.

In case of any miss happening or threat an automated Email is sent to the owner to intimate him about the abnormal conditions so that he can take some preventive actions. The captured images or video from the camera is sent to the controller and user receives it via the Gmail application. It can also be sent to the cloud and transmitted to specified persons.
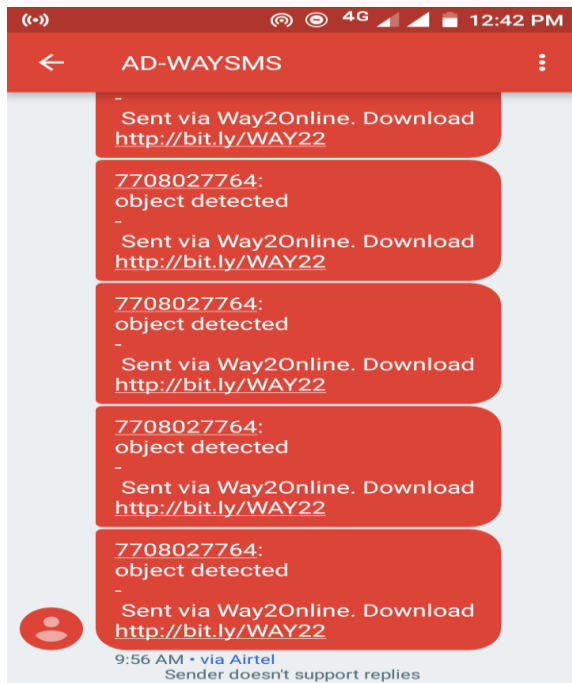
Fig: 4 SMS Alert to the user
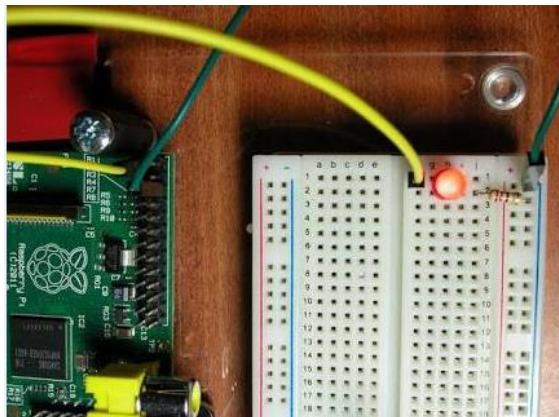
Result 2: Activation of gas valve

Fig: 5 Signal from controller to valve

When the controller receives data from the motion sensor, it sets the valve pin as high. It will cause the valve to diffuse the gas throughout the room. Here the high output of Led states that the motion is detected.

V. CONCLUSION AND FUTURE WORK

Thus we have devised a smart surveillance system capable of recording/capturing video/image and transmitting to a Smartphone. It provides man-less surveillance and alerts user all the time. It is advantageous as it offers reliability and privacy on both sides. This system can also be enhanced in future by adding infrared emitting system at home to detect the person's face even if they wear any mask on his/her face.

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