

Third Vision Hybrid Security System

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Abstract

Security is the range of cover too, or cares from harm. It is used to protect the valuable things such as documents, jewelry, money, person etc. The main purpose of the research is to design an advance and hybrid security system which is known as "Third Vision". Everyone wants higher security on multiple camera technologies which is used to record the footage. In this research a single camera based security system which provides a security to shops, homes, and offices and also provides a security against fire, gas leakage and smoke etc. The camera of this system is used to record the footage when any changes are detected it by the presence of someone or used to detect the gas leakage, smoke etc. by the gas sensor, the smoke sensor at the office, home, shops, industry etc. and to enhance the quality of the image. Every detector and sensors are integrated with the microcontroller with the help of Integrated circuits. The microcontroller will constantly take care of or run every sensor properly. This security system detects any security problem then it will send an SMS message to the Enrolled police station, user mobile, fire station using the GSM modem.

Keywords: Security system, Finger print lock, PIR sensor, Gas sensor, Smoke sensor, Buzzer, Stepper motor, Integrated circuits SMS, GSM communication.

1. Introduction

In the 21 century, Crimes and homes, offices, shops, industry are to catch fire are the prime concern to everyone. Every homeowner, shopkeeper, industries wants to remain stay safe without headache of theft; fire etc. for this we need to develop a "Hybrid security system". Everyone wants to live free from tension of theft and fire whether they are at home, office, shop or far away from home, office, shop etc. they must assure that their home, office, shop etc. are install the "Hybrid security system". It is a single camera based security system that can be used to protect the expensive things which are kept at home, office, shops etc. system also contain the gas sensor, smoke sensor which is used to detect the fire smoke and gas leakage. Mostly exciting security system does not provide this types of security because the features of hybrid security system are not present in any other security system. Many camera based security system have a multiple cameras and they can continuously record the footage of the room in which they installed. In Hybrid security system single camera is record the footage if any changes by the presence of someone and PIR sensor detect the warm radiations the this system and it can detect the fire, gas leakage and smoke by it then it will send a SMS to the owner, fire station and police whose mobile numbers are register in the GSM modem [4]. This system is basically nothing but a electronic device that can be used to detect the threats and attack at home, shop and office. Such a system consists of the following components- sensors which are used to detect the fire, gas, smoke and intruding objects, the camera which is used to record the footage and Finger print lock which is used to start or stop the security system by the right fingerprint [7].

This system works into two ways:-

1. Active way

2. Passive way

People make use of this system according to his wish. When user in the home, office, shop then they use the system in Active way. In this the gas sensor and smoke sensor are activated. If the sensors detect any smoke or gas leakage then buzzer is started and the SMS is send to the owner, police station and fire station. When the users are out of the station then they will use the Passive way. In this all sensors (PIR, gas, and smoke) are activated. If the PIR sensor detect the change by the presence of someone and also detect the warm radiations then stepper motor rotate the camera toward the person and start record the video footage and if gas and smoke sensor detect the gas leakage and smoke then GSM modem is activated and send the SMS to the owner, police station and fire station [1].

2. Literature Review

Requirements for security systems:- Every Homeowner, shopkeeper, Industries, offices want to have security and protect their valuable things which are kept in the offices, room, shop etc. We want to develop a “hybrid security systems” which provide the security from thefts, fire, smoke, gas leakage etc. Whenever we leave the place, we wish to ensure that everything is protected from malicious attacks. There are several approaches to help improve security levels at a business level. One of the most well organized solutions is installing a “hybrid security system” that is self-control. Now days there are many security systems which are used by many persons but they are not provide a security from the theft as well as from the smoke, fire, and gas leakage. In this system there are many sensors work with the microcontroller. They detect the any intruder, fire, gas leakage, smoke if it is in contact with the sensors. After detect the any intruder or any gases the buzzer get start and stepper motor rotate the camera and start the recording and send the SMS to the owner, police station and fire station by the GSM modem. Therefore, we will develop a “Hybrid security system” which provides all facilities for security.

3. Problem Definition

Now days, there are many systems which provide a security to the user which install the system at home, office, shops etc. but many of them have a problems. Multiple cameras based security system which provides a security to the user and the cameras are install the different places in the room and continuously record the video footage of the room. Manager view all the video footage which is captured by the cameras and it is very time consuming task. Many of the systems have the keypad password, PIR sensor, buzzer, microcontroller and camera. We start the system by entering the password. If anyone know the password then he or she disable the system and If the PIR sensor detect any radiations or intruder then camera start the recording and start the buzzer or alarm. There is no way or device by which the owner knows about the theft. Many of the system have the keypad password, PIR sensor, buzzer, microcontroller, camera, stepper motor, PC and internet. The system is active by entering the password. If any intruder detect by the PIR sensor then stepper motor rotate the camera towards the intruder and start record the video footage and PC send the E-mail to the owner with the help of internet. But these systems have a more power consuming and anyone know the password of the system then it is easily disable by any person. In this system PC is on all time and requirement of the internet is must. It is the biggest problem. Many security systems have the keypad password, PIR sensor, camera, stepper motor, GSM modem. The system is start by entering the right password. If any intruder is detect by the PIR sensor then the stepper motor rotate the camera towards the intruder and start the video recording and at the same time SMS is send to the owner or police station. If anyone knows the password of the system then it will be easily disable. As we know that camera based security systems only provide the security to the user from the theft and many security systems is provide the

security from the fire, smoke and gas leakage. But both of these features is not provide by any single systems.

4. Problem Solution

A The solutions of the above problems are:- The solution of the keypad password problem is that we can remove the keypad password system by the finger print system. It will provide the more security than the keypad systems.

4.1. Fingerprint

Fingerprint-coordinating calculations shift significantly as far as Type I (false positive) and Type II (false negative) mistake rates. The precision of the calculation, print coordinating rate, power to poor picture

Fingerprint ID is the component of consequently distinguish one or numerous obscure fingerprints against a database of known and obscure prints. Mechanized unique mark distinguishing proof frameworks are basically utilized by law implementation organizations for criminal recognizable proof activities, the most essential of which incorporate distinguishing a man associated with perpetrating a wrongdoing or connecting a suspect to other unsolved crimes [7].

Fingerprint checks is firmly related methods utilized as a part of uses, for example, participation and get to control e quality [7].

Multiple cameras based security systems will be removed by the single based camera security system. If any intruder is detect by the PIR sensor then stepper motor rotate the camera towards him and the camera start the video recording. Manager only views the footage which is capture the system when PIR sensor detect the radiation. It is less time consuming system.

5. PIR Sensors



Figure1:-PIR Sensor

A passive infrared sensor (PIR sensor) is an electronic sensor that measures infrared(IR) light transmitting from items in its field of view [8]

The PIR sensor itself has two openings in it, each space is made of an exceptional material that is touchy to IR. The lens used here is not really doing much and so we see that the two slots can 'see' out past some distance (basically the sensitivity of the sensor). At the point when the sensor is sit without moving, both spaces identify a similar measure of IR, the surrounding sum transmitted from the room or dividers or outside. At the point when a warm body like a human or creature cruises by, it first catches one portion of the PIR sensor, which causes a positive differential change between the two parts. At the point when the warm body leaves the detecting range, the invert happens, whereby the

sensor creates a negative differential change. These change heart beats is what is detected [9].

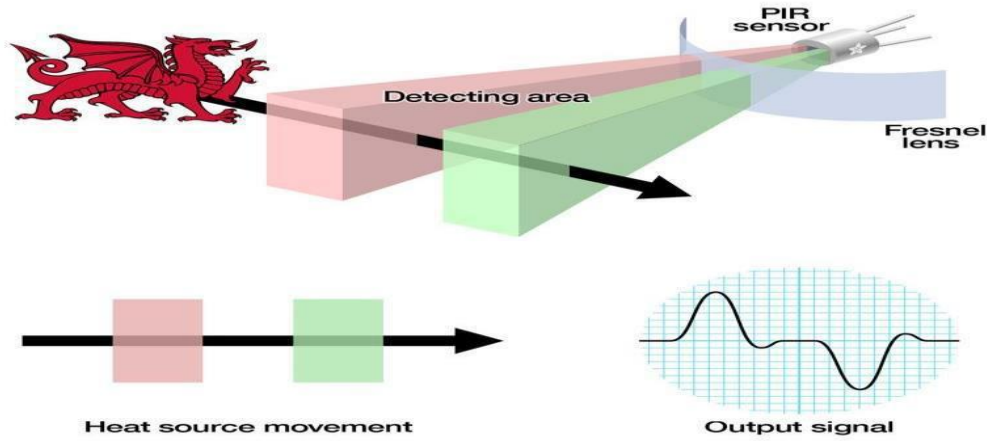


Figure 2: PIR Sensor Detector

6. Stepper motor

A stepper engine is a brushless, synchronous electric engine that believes computerized beats into mechanical shaft pivots. Every pivot of a stepper engine is isolated into a set of steps, sometimes as many as 200 stages. The stepper engine must be sent a different heartbeat for each progression. The stepper engine can just get one heartbeat and approach slowly and carefully and each progression must be a similar length. Since each heartbeat brings about the engine pivoting an exact point normally 1.8 degrees [5].

Single camera based security system have the PIR sensor, buzzer, PC and Internet which is used to send the E-mail to the user but it is more power consuming task and more resources are used in the system. So, It can be removed by the GSM modem [4]

7. GSM Modem

It is the system that is used to send the SMS to the owner, police station rather using mail. So, the system is more reliable and cost of the system is less compared to multiple camera based and pc based security system.

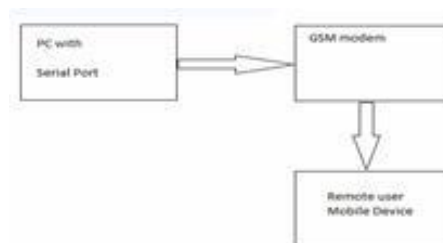


Figure 3:- Block Diagram of GSM Modem

8. Structure of GSM Modem

The network behind the GSM system seen by the customer is large and in order to provide all of services which are required by the network is complicated [3]. It is divided into the following number of sections that are:-

The Base Station Subsystem (the base station and their controllers).

The Network and Switching Subsystem (the part of the network most similar to a fixed network) and is sometimes also referred as the core network

The GPRS Core Networks (the optional part which allows packet based Internet connections).

GSM services such as SMS and Voice calls are produced by all of the elements in the system.

9. Gas and smoke sensor

This sensor is utilized to distinguish the gas spillage and smoke happening in home industry or in shopping centers. This is utilized to distinguish gasses like LPG/butane/Propane/Methane/liquor/hydrogen/smoke. There are distinctive sorts of gas sensor which distinguishes diverse gasses as indicated by various fixation parameter. Here we are utilizing MQ-5 and MQ-2 gas and smoke sensors which distinguish coal gas/methane/LPG and ignitable gas/smoke individually [1].

10. Image Enhancement

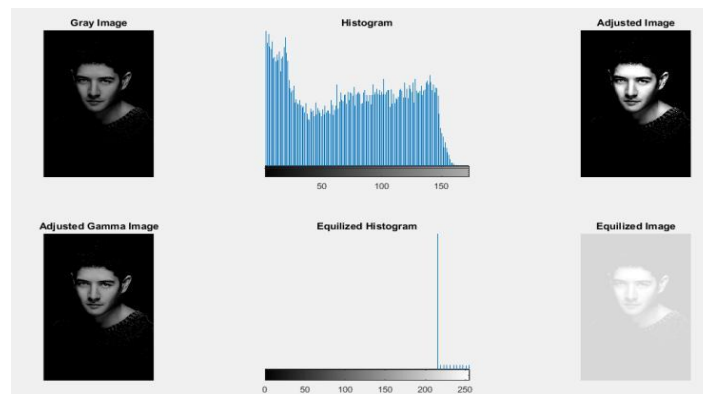


Figure 4. Result of Image Enhancement

11. Future scope

It is idea to provide the security from the malicious attacks like theft, fire, gas leakage and smoke. Anyone can implement the “Hybrid security system-Invisible Eye”. In future, this system can be improved with the advance image processing techniques installed with current system.

12. Conclusion

Hybrid security system-third vision eye remove the traditional multiple cameras based security system. Maintenance is at easily affordable price. It is less time and power consuming. The biggest advantage of this system is that it provides the security form the theft as well as from the fire, gas, smokes etc. In this system many sensors will be used like PIR sensor, gas leakage sensor and smoke sensor. In case of power cut, this system

will work as, we will use the rechargeable batteries. This system will be sending the SMS to the owner, police station, fire station easily by the GSM modem.

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