

# Video Surveillance System Using PIR Sensor

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**Abstract:** This paper is about the design and operation of the PIR sensor-based home security system & testing system that uses the Atmega16 Microcontroller sensor and PIR sensor. This project is designed to ensure the safety of the home by observation. This project is based on a PIR sensor connected to an integrated circuit to generate an alarm. HDMI transmits photos and videos to a display screen that stores this information and sends a warning to the specified email recipient. The Atmega16 Microcontroller is responsible for performance and movement control. On the other hand, video cameras and video cameras, mind-altering and providing live video streaming or recording that happens with later playback. The sensor detects infrared Radiations (IR) emitted from humans within their viewing platform and provides digital output. When the PIR Sensor detects movement, the system will automatically send an SMS to an authorized person.

**Keywords:** PIR Sensor, Video Surveillance.

## 1. Introduction

Observation, from home to large industries, plays a key role in fulfilling our security. Factors such as burglary and theft have always been difficult. In large corporations, personal security refers to the employment of flexible personal information such as activities and behaviors to protect, manage and influence personal information.

Surveillance refers to the remoteness from a distance using electronic devices such as an IP camera. However, CCTV technology is expensive for middle-class residents to install. In addition, this type of program does not notify the user as soon as a crack occurs.

This thesis paper features an alarm system to overcome the shortcomings of common monitoring systems.

In Kenya, for example, the system could be more efficient due to low power consumption especially in remote areas where electricity is a challenge. The use of machine communication provides advantages compared to the traditional Natural Acquisition System (DAS). The system allows monitoring and control to be done without human intervention. The system becomes completely automatic, and the number of errors decreases with its performance increasing significantly.

Each person should have a choice to live without fear and confidence to do any business without fear of insecurity.

The program developed in this study provides security while maintaining the privacy of certain individuals as only one person can view it. In addition, it uses a simple circuit.

The program uses AVR architecture in its operation, which allows the transfer of images to a smartphone.

The cultural exploration program goes hand in hand with the various challenges and costs associated with the use of force. An efficient power transfer system is attractive, and can take pictures during a jump.

The system, therefore, allows people to be more independent and feel safe in their daily activities. In addition, it sends an awareness signal, making it better than the current monitoring programs. Project implementation is easy.

The homeowner/company places the camera at a specific location that needs to be checked to ensure safety. The system allows the user to access and monitor security from a variety of locations, even remote locations.

The user can monitor the remote test system using a smartphone with connected Internet access. The program is useful for projects aimed at limited security settings in a particular area, but its security is considered in different areas.

The PIR sensor is one example of motion detection. The combination of Fresnel lens, amplifier circuitry, comparator, and time rotation creates the basic structure of PID (Passive infrared Device), the PIR sensor is a critical component.

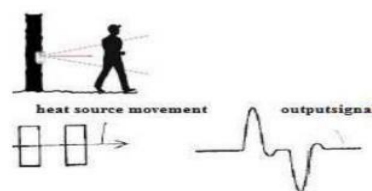


Fig. 1. PIR sensor working

Fresnel lens is a special filter that focuses on infrared signals on an object. Contains a number of focus cracks that change the light path. The lens is designed to collect energy, focus and distribute light, and collimation.

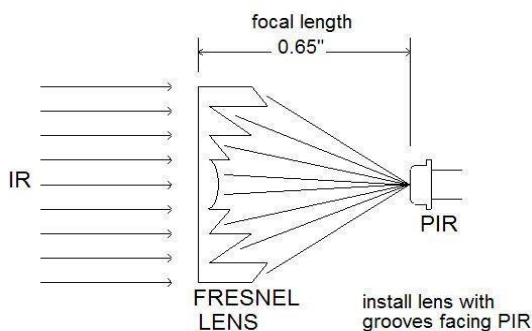


Fig. 2. Fresnel lens

## 2. Objectives

The primary objectives of this study are:

Creating a low-cost and flexible security system where space is a problem and specific objectives are;

- Design a simple, inexpensive, and easy-to-use PIR protection system using existing technology.
- Design a PIR-based security plan for people who may want to control their work, office, or home remotely.
- Build a PIR security-based system.

The system is small in size, portable, and independent of its power source making it easy to use. It has the power of quick observation and is less expensive for residential and human use

## 3. System Specification

*Security Cameras:* Security cameras have a wide range of preferences with many features. Deciding which camera to use for home use can be a daunting task given the many options.

*Motion Sensors:* Motion Sensors use infrared sound and vibrate to detect moving objects or people. Sensors collect data in terms of speed, speed, and position of an object. When movement sensors are attached to the home security system, they can detect movement that warns homeowners of any security breaches

The aim is to improve a security system that minimizes home costs. The system uses a small PIR (Pyroelectric Infrared) sensor built into the microcontroller. The microcontroller sensed human movement by detecting infrared radiation emanating from the human body.

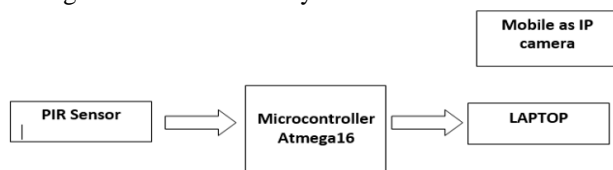


Fig. 3. System block diagram

## 4. Future Vision

This project offers a wide range of additions to add new features. Since all image processing is done remotely, there are no resource issues other than network bandwidth.

We may install software that enables it to detect objects on its own. Therefore, we can make it completely independent. Also, with the presence of GPS navigation and software mapping, the software has the ability to find the best way to get to a specific location.

Also, by making it sturdier and more protective, we could make an all-terrain robot, which would make it a perfect looking robot. There is also the option to add audio processing to a remote computer, so it gives it great viewing power. The possibilities are endless. This state-of-the-art robot provides a more advanced research platform to improve its capabilities.

## 5. Conclusion

With improved awareness of the importance of home security, homeowners are on the lookout for an efficient surveillance system which is cost-friendly.

This design covers all the vital areas of a home security system. Detection of intrusion into the home is made possible using passive infrared sensors.

The sensor uses infrared radiation changes as a result of human motion across its field of movement.

When movement is detected, our software will send an SMS to the owner. We can use a mobile phone as an IP camera and see the place live.

## Acknowledgement

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