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Adaptive Technology PIR Based Raw and IB Security System

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Abstract

This project is special and efficient system for security purpose. In this project we provide criminals detection and mention the direction and included shoot out with laser with On the basis of rotation of stepper motor. These days, radars are being used for detection but there are some materials like indium phosphide that can absorb the electromagnetic waves, so, to eliminate this disadvantage we use the P.I.R sensor which does not work on the principle of sending and receiving the EM waves as RADAR does, but it detects the infrared radiations of the human body which can't be blocked by any material and then identifies the target. Due to increasing number of crime and burglary, the need of security system is very essential. The security system that monitors the area throughout the time and reacts effective to the threat is in need. We have lots of security systems in the market for both indoor and outdoor applications such as ultrasonic detectors, CCTV, microwave detectors, photoelectric detectors, infrared detectors etc. However one or the other systems have the limitations of being expensive, more electrical power consumption, more memory space utilization of the recording system and complex circuitry, etc. A solution to overcome these problems could be by using a sensor of low cost which has the ability to detect the intruders as they come within the sensor's detection range and generates an output. This output can be used for further signal processing or activating other devices like alarm system, lighting system, recording system and similar devices. This could at least save some power consumptions as some components get actuated only when there are intruders in the sensors detection range. Passive Infrared Sensor is a low cost, low power and reliable sensor. Therefore it was felt that a PIR sensor based security system consisting of the sensor, laser shooter and a LCD pageant could overcome few or all of the above stated problems. The sensor can detect the presence.

Key Words: - PIR, Stepper Motor, Microcontroller, LCD

1. Introduction

Security has become an important topic of research in this world of violence and reign of terror. Anyone can enter to the sensitive places and can lead to the loss of life and property due to damage caused by that person. In order to eliminate these kinds of activities we need some efficient system which can detect the motion through restricted regions. This project focuses on the development of the system which can detect motion automatically and can also take the action to shoot.

The basic working of the proposed system is when any person comes from main gate IR sensor activate and provide an out to microcontroller. MIC indicate correct direction and weep the buzzer and only indicate led and no operation of motor and laser gun. But when any person is coming from except to main gate then PIR sensor activate and provide a positive output to 4049ic, 4049ic is a inverter IC which provide negative output to microcontroller and microcontroller display in LCD

correct direction and stepper motor on and moves in indication direction and stop for m/s laser gun on and indicate the buzzer and red LED and person is shoot with EM wave. So a circuitry is made which shows the connection between different components and code for the PIR is proposed.

2.PIR Sensor

A Pyroelectric Infrared Sensor (PIR sensor) is an electronic sensor, in that type of sensor measures the infrared (IR) light radiating from objects or human in its field of view. The normal sensor emits the radiation but in this sensor detect the radiation.

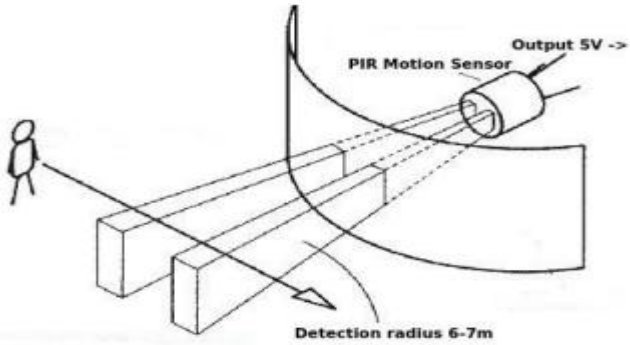

Fig:-1.PIR sensor

All the objects with a temperature above absolute zero emit heat energy in the form of radiation. Usually this radiation is not visible by human eye because it radiates at infrared wavelengths, but in this infrared can be detected by electronic devices designed for detecting the human movement

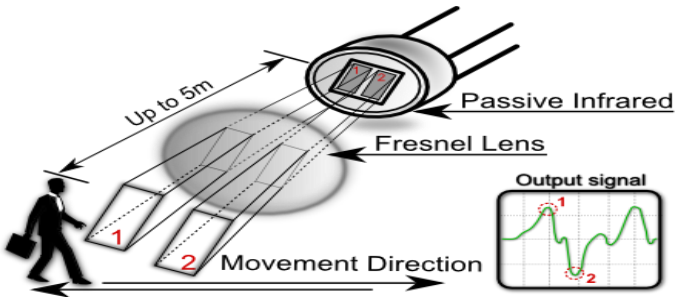

Fig:-2. Internal structure of PIR sensor

The PIR Sensor has a range of approximately 20 feet (6 meters). The sensor is designed to identify the slowly changing conditions that would happen normally as the daily progresses and the environmental condition changes, but it responds by making its output when sudden changes occur, such as when there is motion. This device is designed mainly for indoor use. Operation outside or in very high temperatures may affect stability negatively. Due to the high sensitivity of PIR sensor device, it is not recommended to use the some condition like rapid environmental changes and strong shock or vibration and also in not working in direct sun light or direct wind from a heater or air condition.

3. Diode IN4007

In this project we have used IN 4007 diode as a rectifier. IN 4007 is special diode to convert the AC into DC. In this project we have used two diodes as rectifier. To convert the pulsating DC into smooth DC we have used Electrolytic capacitor as main filter. Capacitor converts the pulsating DC into smooth DC and this DC is connected to the Regulator circuit for Regulated 5 volt DC.

Fig. 3. Diode IN4007

4. Crystal Oscillator

Crystals provide the synchronization of the internal function and to the peripherals. Whenever ever we are using crystals we need to put the capacitor behind it to make it free from noises. It is good to go for a 33pf capacitor.

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Fig.4. 11.059 Crystal oscillator

5. Microcontroller

In this project we use 89c51 as a microcontroller. As per the input requirement and output control we design software and wrote a source code in the assembler. We use micro51 assembler for this project. After writing a source code in the assembler we compile and assemble the program and then this program is known as assemble file. After assemble file is converted into hex file. With the help of special programmer we insert this hex file into the microcontroller. For this project we use 89c51 programmer to insert the hex file into microcontroller.

Once we program the microcontroller, we use the IC for our electronics hardware circuit.

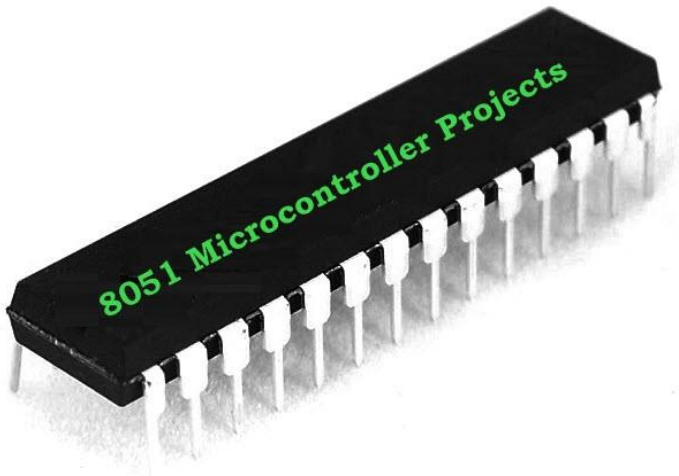

Fig. 5 : 8051 microcontroller projects

6. SYSTEM DESIGN

- When the person enters from an unauthorized entry, his or her body temperature is sensed by the PIR sensor.
- These thermal radiations are focused on PIR filter using Fresnel. Lens array.
- The sensing element converts these radiations into 1mv of charge which is then amplified by the FET.
- The step down transformer steps down the voltage from 220v to 9v.
- A full wave rectifier converts the AC to DC.
- Electrolytic capacitor is used as the main filter in order to convert the pulsating AC to DC.
- Voltage regulator regulates the power supply to 5v
- IC 4049 is used as an inverter IC for the microcontroller.
- The position of the person is displayed on the LCD pageant.
- ULN2003 the driver IC for the stepper motor directs it towards the position of the person
- The laser shooter points in the direction of the person
- Buzzer beeps and the LED glows.

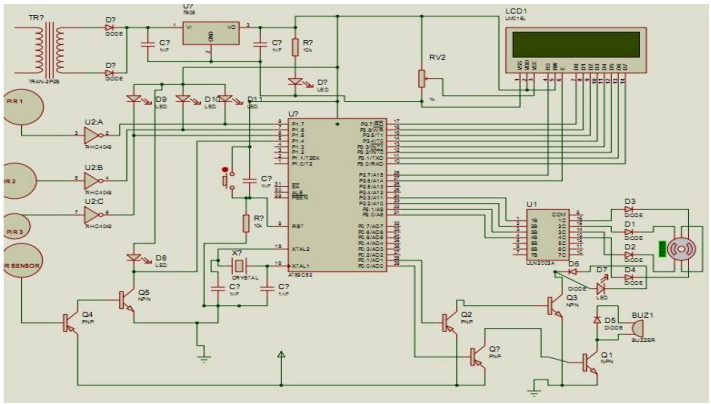

Fig:-6: Circuit Designing Using Proteus Simulator.

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7. METHOD:-

In this proposed system, the PIR sensor based system which evaluates the development of a very Low-cost security system using microcontroller. The human movement is detected using the PIR sensors. In this time, the system triggers an alarm detecting the presence of person in a specific interval of time and simultaneously sends a message to the buzzer through microcontroller. When the security system, buzzer is activated, the shooter is activated. This highly reactive approach has low computational requirement. Therefore it is well suited for security system

8. FUTURE WORKS:-

In this PIR Sensor Based Security System, we have used low power, low cost PIR sensor that are easy to interface with other components. By using this system we were able to reduce the power consumed and memory space of the system. Considering all above points, followings are our future works set to improve the system: Use more than one webcam for video recording and integrating these webcams with the system. Work on the software to record videos from many webcams installed.

9. CONCLUSION:-

In this paper, a PIR sensor based security system is proposed. It will combat the shortcomings o the RADAR system as they are radar absorption materials such as jejunum materials which absorb the EM waves thus detection is hindered. The PIR sensor works by sensing the radiations of human body thus is very effective.

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