

# MOTION DETECTION USING PIR SENSOR

<sup>1</sup>Ajay Kumar Tiwari, <sup>2</sup>Prince Raj, <sup>3</sup>Justice Kumar, <sup>4</sup>Mr. Ashish Tiwary

Gandhi Institute of Engineering & Technology  
Department of Applied Electronics & Instrumentation Engineering  
Gunupur, Rayagada, Odhisha, India, Under BPUT

- 1 Ajay Kumar Tiwari (University Registration No.- 1201210312)
- 2 Prince Raj (University Registration No.-1201210293)
- 3 Justice Kumar (University Registration No.-1201210189)
- 4 Mr. Ashish Tiwary (Lecturer)

**ABSTRACT:** The objective of this project is to develop a motion sensor alarm based on a Passive Infra-Red (PIR). This project is aim to build a sensor system which is transmit and receive the signal. This project is about the motion detection using Infra-Red sensor in wirelessly. Besides that, it also acted as an auto power switching system. When the sensor is triggered, the signal will transmit wirelessly to take further action. For this project, we relate this sensor system with an auto power light switching system. Which mean when the sensor is triggered, light in a room will automatically switch ON. In order to transmit signal wirelessly, this project will used radio frequency module to transmit the signal. For the controller circuit part, this project will use Programmable Interface Controller (PIC) to control the circuit, because it is cheaper and easier to program. The objective of this project is tending to switch ON the light automatically and fan based on the temperature. Besides that, signal transmit wirelessly can avoid the circuit malfunction because of wire broken. After done some research from the internet and advice from the lecturer, tools and equipment are identified to completing the project. Current temperature will shows on a LCD display.

**Keywords:** Power Light Switching System, Budger, Motion Detector PIR Sensor.

## 1. INTRODUCTION

Motion detection using a PIR sensor circuit can be used for providing security to home, shopping malls etc, as the PIR sensor used in this system detects the motion of human around this circuit. With the help of buzzer, we can identify the motion of human which was detected by the sensor.

This system can be used at any place where security is needed. Security is needed by everyone in the society now-a-days to protect their property or confidential information from others which is sensor sense a human motion and then transmit the signal wirelessly.

However, this project will relate to auto power ON light and fan system. When the sensor senses a human motion in the sensor's detection area, sensor will be triggered and then the room's light will automatically switch ON. It is useful for us when we cannot find the switch in the dark condition.

For the fan's function, it is depends on the room temperature, when the temperature is higher, fan will run when the PIR had detect motion in the detection area. When the room temperature is low, fan will not run. Degree of temperature is measure by the temperature sensor and temperature will show on a LCD display (2x16). Light and fan will automatically OFF when the user was going out from the room. As long as PIR sensor does not detect motion in the detection area, light and fans are not function and the fan is depends on the room temperature. Once the sensor is triggered, system will have around 2 minutes to run the function. After 2 minutes and sensor does not detect any motion, light and fans will be switched OFF automatically.

## 2. PROPOSED SYSTEM

Alarm based human motion detection is an embedded system which we are used to provide security. This is our proposed system. Instead of manual security if we use alarm based detection system for detecting human motions to provide security which reduces man power and is very cheap. As we know human body radiates heat in the form of Infrared radiations. When a person moving around this circuit, PIR sensor<sup>2</sup> detects the change in the IR levels of surroundings and sends a signal to the microcontroller.

Features of proposed system are:

It is very cheap and affordable.

It is efficient and portable that means we can place this circuit at any place easily. Very easy to use.

Maintenance cost is low.

### 3. DOMAIN ANALYSIS

#### 3.1 INTRODUCTION

The domain is “Motion detection using PIR sensor” for any place where security is needed. The main aim is to develop an alarm based security system which takes power supply as input and the sensor which we used will detect the motion and gives a message saying “motion detected” on PC and also sound which will be produced by the buzzer.

#### 3.2 Functional Requirements

Functional Requirements are :-

Power supply (+5v) to the hardware circuit.

An interrupt is given to microcontroller by PIR sensor when it detects the motion.

A buzzer which is used to produce sound.

#### 3.3 Non Functional Requirements

Hardware Requirements of the project are

Transformer (230-12 V AC)

Voltage Regulator (LM 7805)

Rectifier

Filter

IC regulator (7805 & 7812)

Printed Circuit Boards

Micro Controller<sup>3</sup> (AT89S51/ AT89C51)

Adapters (230 V AC to 12 V DC)

Push Buttons

LM35

MOC3021

IN4007

IN4148

LEDS

Passive infrared Sensor

Buzzer

Connecting wires

Crystal Oscillator

Capacitors (1000mf/30v)

Resistors

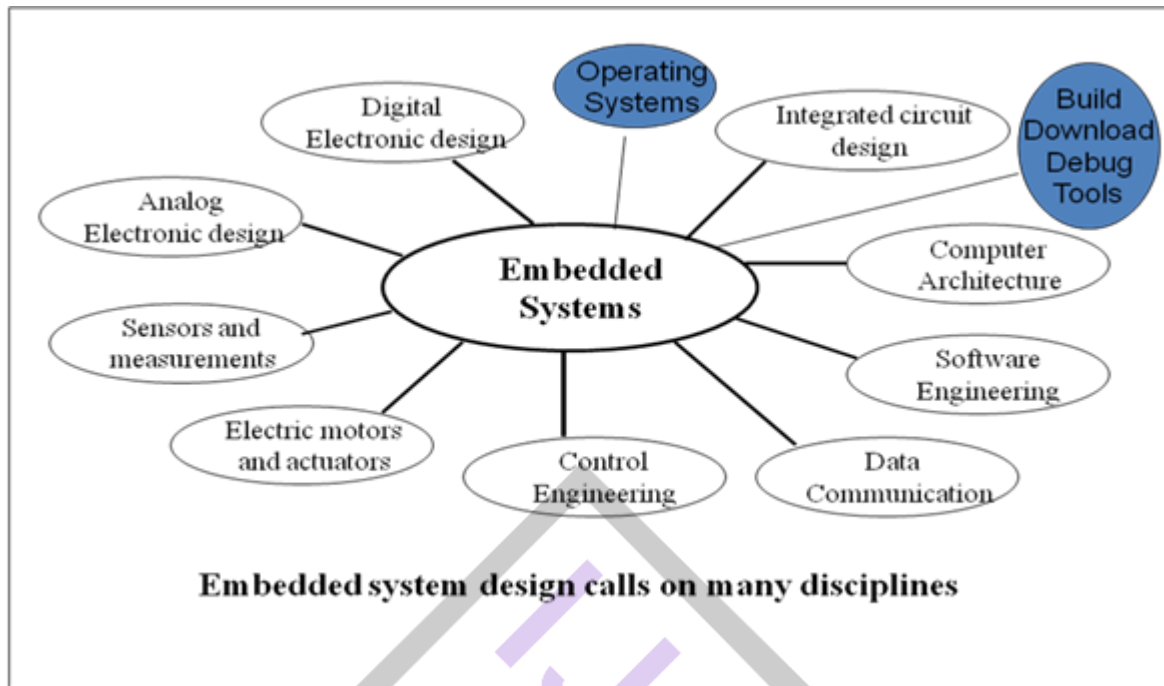
Diodes (IN4007)

### 4. SYSTEM DESIGN

#### 4.1 Circuit<sup>5</sup> Description

In our project, we used microcontroller from ATMEL which plays an important role having configured to work with a crystal oscillator of A Passive Infrared Sensor (PIR sensor) is used in this project to detect the human presence, which is connected to port 2.0 of the microcontroller. It gives an interrupt to the microcontroller when it detects the human presence at its field of view. To indicate this, a buzzer is connected to same port 2.0 pin of the microcontroller.

Fig 1: System Design of Our Proposed System



4.2 User Interface Design

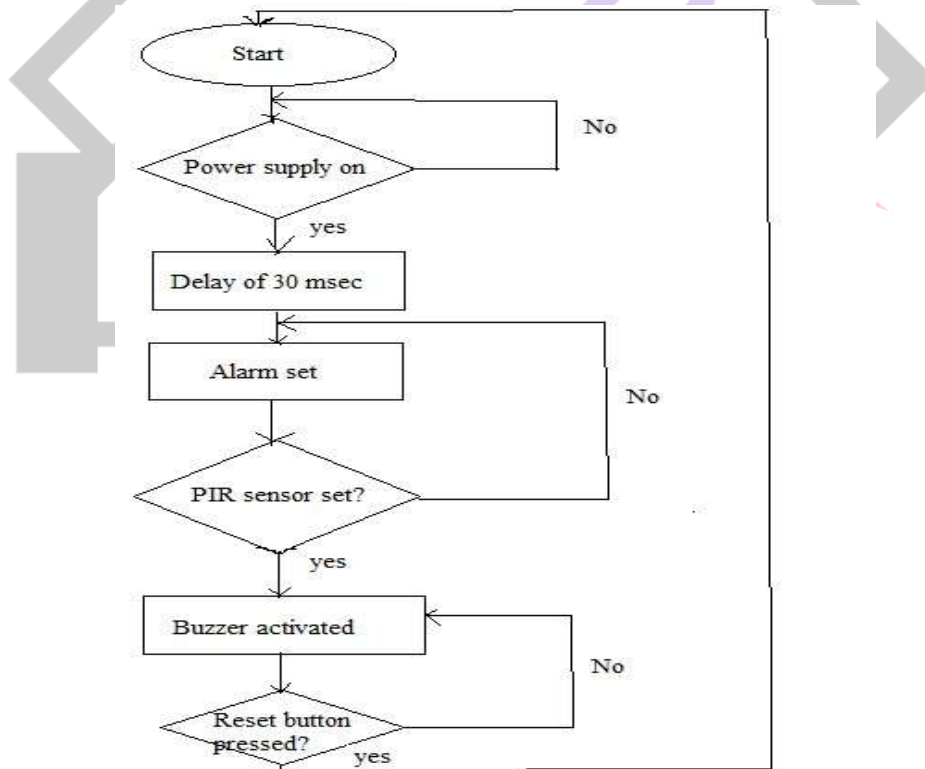


Fig 2: User Interface Design of Proposed

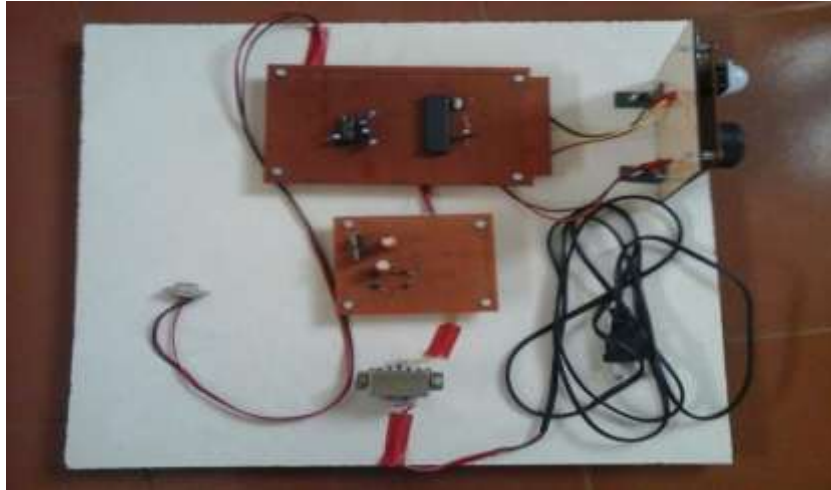
This diagram mainly represents the interaction between the user and the system. The process of how system is responding to the user activities and the whole functionality of the system is represented in the following diagram. This diagram also shows the flow of activities done by the system and the user.

## System

### 5. OUTPUTS/ RESULTS

#### 5.1 Result 1

The result shows the final hardware design of the proposed system. This result clearly shows how all the components required for our system is connected.



### 6. CONCLUSION

Hereby we come to an end of our project “**MOTION DETECTOR USING PIR SENSOR**”. This project gives us an idea to detect the motion. This project can be used anywhere either at home or offices. This is also cost efficient. Thus by this attempt of our circuit can be used as protecting device and can be used for security also. It can be used as a kind of anti-theft device. It is very much cost efficient and can be used easily and efficiently.

### 7. ACKNOWLEDGEMENTS

Apart from the efforts of us, the success of this project depends largely on the encouragement and guidelines of our guide Mr. Ashish Tiwary, Lecturer, Dept Applied Electronics & Instrumentation Engineering, GIET, Gunupur, Rayagada under BPUT all the way throughout the project. The encouragement given by our Head of the Department, Mr. Suprajit Pradhan & also our Faculty members made our project reach the saturation point.

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