

**DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING
College of Engineering and Technology
SRM Institute of Science and Technology**

MINI PROJECT REPORT

ODD Semester, 2023-2024

Lab code & Sub Name : 18ECO108J - Embedded System Design Using Arduino

Year & Semester : 3rd Year, 5th Semester

Project Title : Motion Detection System

Lab Supervisor : **Mr. Praveen Kumar S, Dr D Vijayalakshmi**

Team Members :
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2. Navdeep Singh Jakhar (RA2111032010030)

Particulars	Max. Marks	Marks Obtained
		Name:
		Register No :
Program and Execution	20	
Demo verification & viva	15	
Project Report	05	
Total	40	

MOTION DETECTION SYSTEM

OBJECTIVE:

The objective of this project is to design, implement, and evaluate a motion detection system using Arduino Uno and PIR sensor technology. The system aims to accurately detect and respond to motion in its surroundings, demonstrating the practical application of sensor integration and Arduino programming in the field of motion sensing technology.

ABSTRACT:

This project introduces a motion detection system crafted through the integration of Arduino Uno and PIR (Passive Infrared) sensor technology. The system utilizes sensor data to detect and respond to motion within its environment, showcasing the capabilities of Arduino programming in conjunction with sensor technologies. The abstract provides an overview of the project's design, implementation, and evaluation processes, emphasizing the practical implications and potential applications of the motion detection system.

In addition to its core functionality, the project explores the adaptability of the system in real-world scenarios, addressing challenges in calibration and sensitivity. The report delves into the intricacies of Arduino programming for sensor interfacing, offering insights into the codebase and decision-making algorithms employed.

Furthermore, the project evaluates the system's performance metrics, including accuracy, response time, and false positives/negatives, providing a comprehensive understanding of its effectiveness. The outcomes of this project contribute to the ongoing discourse on sensor-based systems, shedding light on their relevance in enhancing security, automation, and user experience in diverse settings. This exploration extends beyond the technical implementation, considering broader implications for future developments in the realm of motion sensing technology.

INTRODUCTION:

In conclusion, this project successfully navigated the intersection of Arduino Uno and PIR sensor technology to create a robust and practical motion detection system. The exploration of this system has provided valuable insights into the capabilities and challenges associated with designing intelligent, sensor-driven applications.

The motion detection system showcased its efficacy in accurately identifying and responding to motion, demonstrating its potential applications in diverse settings. From bolstering home security to optimizing industrial automation processes, the system's versatility positions it as a valuable asset in the realm of smart technologies.

HARDWARE/SOFTWARE REQUIREMENTS:

Hardware Components -

1. Arduino UNO R3
2. PIR Sensor
3. Breadboard
4. LED
5. Buzzer
6. USB Cable
7. Connecting Wires

Software Components -

1. Arduino IDE

CONCEPTS/WORKING PRINCIPLE

The project functions by integrating an Arduino Uno with a PIR (Passive Infrared) sensor. Key components and concepts include:

- **PIR Sensor:** Detects changes in infrared radiation patterns caused by moving objects like humans or animals.
- **Arduino Uno:** Serves as the system's controller, processing PIR sensor data and executing actions when motion is detected.
- **Digital Output:** The Arduino manages external devices, turning on an LED and activating a buzzer to provide a visual and auditory indication of detected motion.
- **Loop-Based Operation:** The Arduino continuously checks the PIR sensor's output in a loop. When motion is detected, it triggers the LED and buzzer.
- **Serial Communication:** The Arduino communicates with the serial monitor, sending a "Motion Detected" message when it senses motion.

This system offers practical motion detection capabilities applicable in security and automation scenarios.

APPROACH/METHODOLOGY/PROGRAMS:

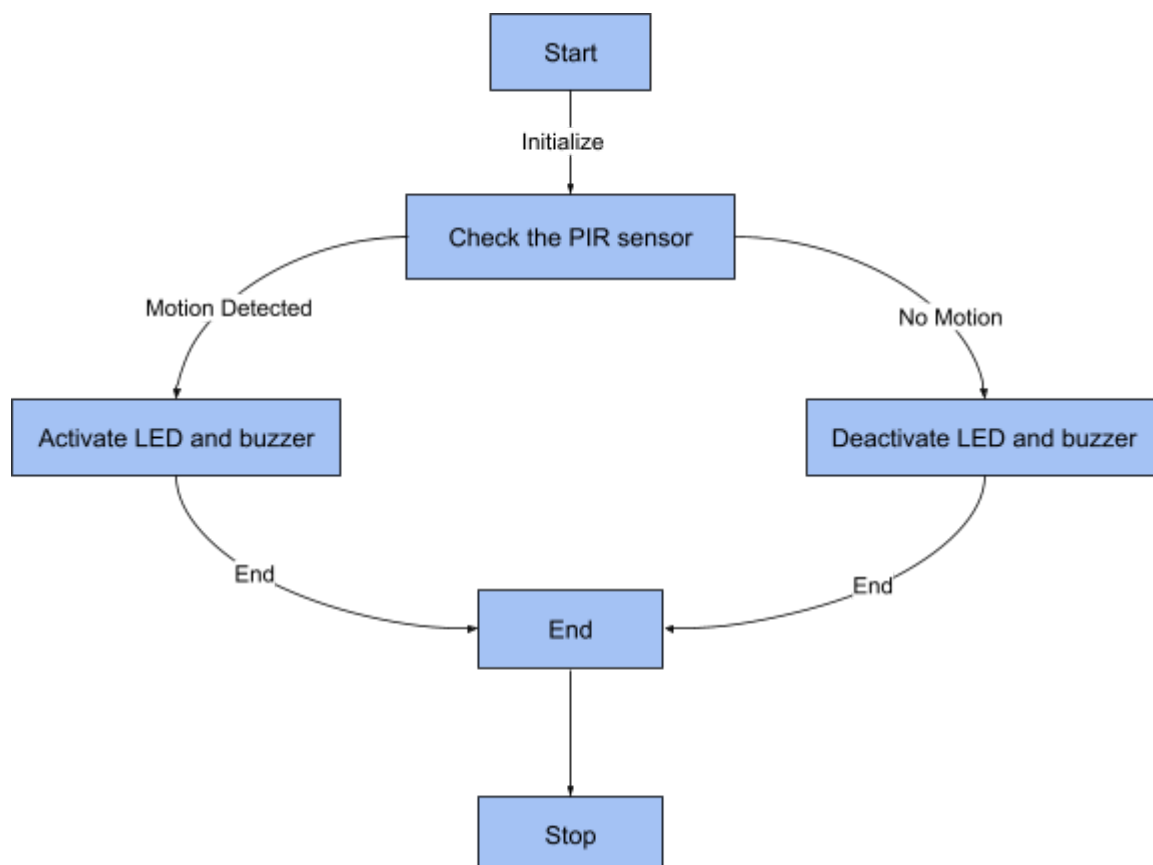
```
int ledPin = 13;
int buzzerPin = 11;
int pirPin = 2;
int pirStat = 0;
void setup()
{
    pinMode(ledPin, OUTPUT);
    pinMode(buzzerPin, OUTPUT);
    pinMode(pirPin, INPUT);
    Serial.begin(9600);
}
```

```

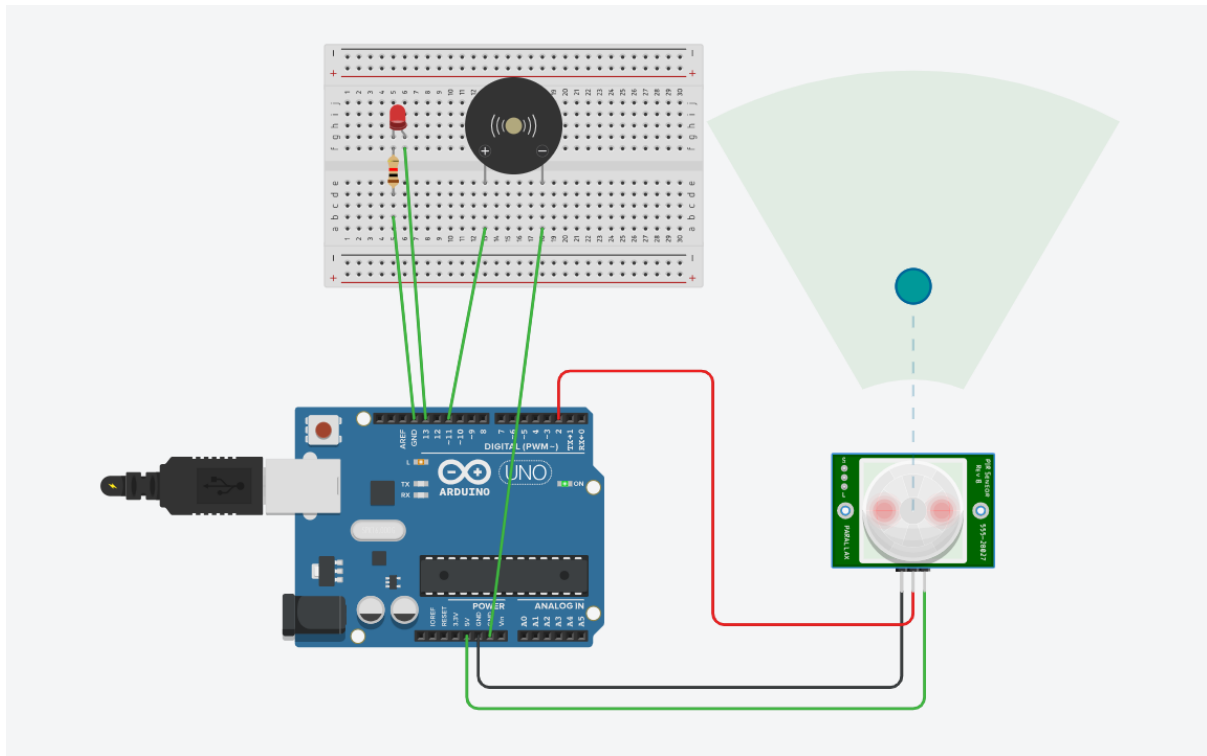
void loop()
{
    pirStat = digitalRead(pirPin);
    if (pirStat == HIGH)
    {
        digitalWrite(ledPin, HIGH);
        digitalWrite(buzzerPin, HIGH);
        Serial.println("Motion Detected");
    }
    else
    {
        digitalWrite(ledPin, LOW);
        digitalWrite(buzzerPin, LOW);
    }
}
}

```

FLOWCHART:



OUTPUT:



CONCLUSIONS:

In conclusion, this project successfully navigated the intersection of Arduino Uno and PIR sensor technology to create a robust and practical motion detection system. The exploration of this system has provided valuable insights into the capabilities and challenges associated with designing intelligent, sensor-driven applications.

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REFERENCES:

1. <https://docs.arduino.cc/hardware/uno-rev3>
2. https://www.tutorialspoint.com/arduino/arduino_pir_sensor.htm
3. <https://arduinogetstarted.com/tutorials/arduino-motion-sensor>