Domain : HOME AUTOMATION

Title of the Project

MOTION SENSOR LIGHT BLINKING

IOT PROJECT REPORT

On

Motion Sensor Light Blinking and Reporting system using Arduino

By

Balimidi Rajkumar– (202P1A0403)

DEPARTMENT

OF

"ELECTRONICS & COMMUNICATION ENGINEERING"

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY

(AUTONOMOUS)

(Approved by AICTE New Delhi, Permanently Affiliated to JNTUA, Anantapur)

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VIDYANAGAR, PALLAVOLU(V), PRODDATUR – 516360, YSR (Dt) , AP

ABSTRACT

The Motion Sensor Light Blinking used to turn on or turn off without human interface. If a person moves infront of the sensor then , it can detects the human being movement and the light can be glown. The light can be turned on upto the movement stops. When the movement is stop the can be turned off the after 5 seconds. By using the Arduino IDE software this sensor can detect the movement and turned on or off by using the relay switch. The pir sensor can take major work on this project . The project aims to develop an intelligent and energy-efficient lighting system based on motion sensing technology. The system utilizes passive infrared (PIR) motion sensors to detect human presence and triggers the corresponding lights to turn on or off, ensuring optimal illumination in various environments.

INTRODUCTION

Generally, the light can be turn on/off by manually. It means that the light can be turn on/off with the human interface. If any person need to turn on/off the light then the person need go to the near to the socket and turn on/off the light. This is the major problem by turning on/off the light by manually. So,this problem is mostly arised the old age people to turn on/off the light.These people can't be move near to the socket and turn on/off the light. And it is also danger to the children if they were put the hands inside the socket. So, without human interface the light can be turn on/off . So,this problem can be overcome by the motion sensor. The motion sensor we use the PIR (Passive Infrared Sensor) .It is used to overcome the light turn on/off by manually. These projects often use motion sensors, such as passive infrared (PIR) sensors, to detect movement and trigger an LED or a series of LEDs to blink or light up in response to the detected motion. You can find various tutorials and guides online that provide step⬚by-step instructions on how to create such projects using components like Arduino boards, motion sensors, and LEDs. These projects are popular among hobbyists, students, and electronics enthusiasts interested in home automation, security systems, or interactive installations.

The project aims to develop an intelligent and energy-efficient lighting system based on motion sensing technology. The system utilizes passive infrared (PIR) motion sensors to detect human presence and triggers the corresponding lights to turn on or off, ensuring optimal illumination in various environments. By integrating motion sensors with the lighting infrastructure, the project enhances energy conservation and promotes a sustainable approach to indoor and outdoor lighting. Here, the project software using the Arduino IDE software.

Components :

1. Arduino Uno

2. Arduino IDE software

3.PIR Sensor Module

4. Relay(5v)

5. AC Bulb socket and plug

6. Bulb

7. 7-12v DC Battery

8. Breadboard

9. Jumper wire

CIRCUIT DIAGRAM : -
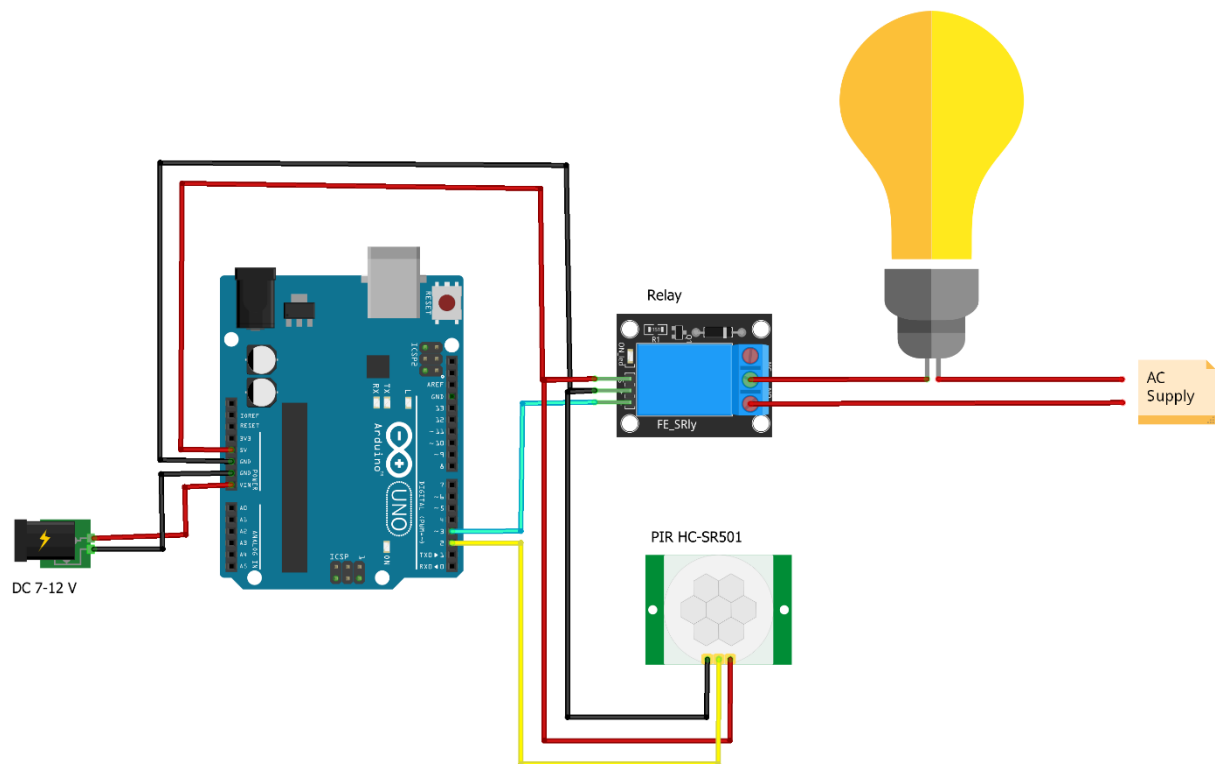
Fig :- Circuit diagram of the Motion sensor light blinking

<u>Connecctions</u> :-

Consider a Arduino Uno and make the connections by using the jumper wires. The sensor positive is connected to the 5volts power supply of Arduino uno, sensor negative is connected to the GND of Arduino and the IN pin of sensor is connected to the pin-2 of the Arduino. The relay positive is connected to the 5volts power supply of Arduino uno, relay negative is connected to the GND of Arduino and the IN pin of relay is connected to the pin -3 of the Arduino.The 7-12volts battery of positive is connected to the 5volts power supply of Arduino uno, battery negative is connected to the GND of Arduino .The relay of one pin is connect the bulb is connected to the series connection of the AC power supply positive and AC power supply negative is connected to the relay.

<u>Working Principle</u> :-

If a person moves infront of the sensor then , it can detects the human being movement and the light can be glown. The light can be turned on upto the movement stops. When the movement is stop the can be turned off the after 5 seconds. By using the Arduino IDE software this sensor can detect the movement and turned on or off by using the relay switch. By using the jumper wires we can connect the connections as per the circuit diagram. The breadboard is used to make the connections are easy. The light can be turned on upto the motion was detected. If the motion was stopped then the light can be turned off after the few seconds . The time was varied by using the the PIR sensor of potentiometer. And also varied the sensitivity by using the PIR sensor of potentiometer. The sensitivity range in between the 25cm and 20m. The sensor can be sensed only around the 180 degrees.When the code was dumped or added to the

Arduino uno and the Arduino was performed its operation based on the program.The program was written in the software of the Arduino IDE software . When the code was inserted the sensor can works and the operated the sensor to the relay . This relay was performed like a switch . So, this relay was turn on or turn off automatically based on the program by using Arduino Uno and the sensor. To working all the components it needs to the 5v DC power supply. The 5v power supply can connect the 9v DC battery . The project aims to develop an intelligent and energy-efficient lighting system based on motion sensing technology. The system utilizes passive infrared (PIR) motion sensors to detect human presence and triggers the corresponding lights to turn on or off, ensuring optimal illumination in various environments. By integrating motion sensors with the lighting infrastructure, the project enhances energy conservation.This project can be usuful to the old age people and the children and also a energy conservation.

Advantages :-

1. Energy Efficiency: The system conserves energy by activating lights only when motion is detected, reducing unnecessary usage and lowering electricity bills.

 2. Cost Savings: Users benefit from reduced energy costs, making it a financially viable solution in the long run.

3. Environmentally Friendly: By minimizing energy consumption, the system contributes to environmental conservation and reduces the overall carbon footprint.

4. Enhanced Safety: Immediate illumination in response to motion detection enhances safety and security, especially in dimly lit or outdoor areas, deterring potential intruders.

5. <u>Customizability</u>: Users can adjust sensor sensitivity and duration, tailoring the system to specific requirements and optimizing its performance.

6. <u>Convenience</u>: The automatic operation eliminates the need for manual control, providing a hassle-free lighting solution.

<u>Disadvantages</u> :-

 1. <u>Limited Range</u>: PIR sensors have a limited detection range and may not cover larger areas effectively, requiring multiple sensors for comprehensive coverage.

2. <u>Dependency on Power Supply</u>: The system relies on a stable power supply. In case of power outages, the motion sensor-based lighting may not function as intended.

3. <u>Installation Complexity</u>: Proper installation and positioning of sensors are crucial for optimal performance, which might require technical expertise.

4. <u>Initial Cost</u>: The initial setup cost, including sensors and compatible lighting fixtures, can be relatively high, although it is often offset by long‑term energy savings.

5. <u>Maintenance</u>: Regular maintenance is required to ensure sensors are clean and functioning correctly, avoiding issues like false triggers or reduced sensitivity.

<u>Applications</u> :-

 1. <u>Security Lighting</u>: Install motion sensors on outdoor lights. When motion is detected, the lights can blink to deter potential intruders or alert homeowners.

2. <u>Staircase Lighting</u>: Implement motion sensors on staircases. When someone approaches, the steps' lights can blink to guide the way and enhance safety.

3. <u>Energy Conservation</u>: Use motion sensors in indoor spaces like offices or restrooms. Lights can blink to indicate occupancy, encouraging users to turn off lights when leaving the area, thus conserving energy.

4. <u>Interactive Art Installations</u>: Create interactive art projects where motion sensors detect the presence of viewers. Lights can blink or change colors in response to the viewers' movements, enhancing the overall experience.

5. <u>Retail Displays</u>: Implement motion sensors in retail store displays. When customers approach a specific product, lights can blink to draw attention, creating an engaging shopping experience .

<u>Conclusion</u> :-

Motion sensor lights revolutionize lighting solutions with their energy efficiency, convenience, and enhanced safety.Main purpose of home automation system is to provide ease to people to control different home appliances with the help of the android application present in their mobile phones and to save electricity, time and money. Embrace the power of automated lighting for a brighter and smarter future!.

Project Images :-
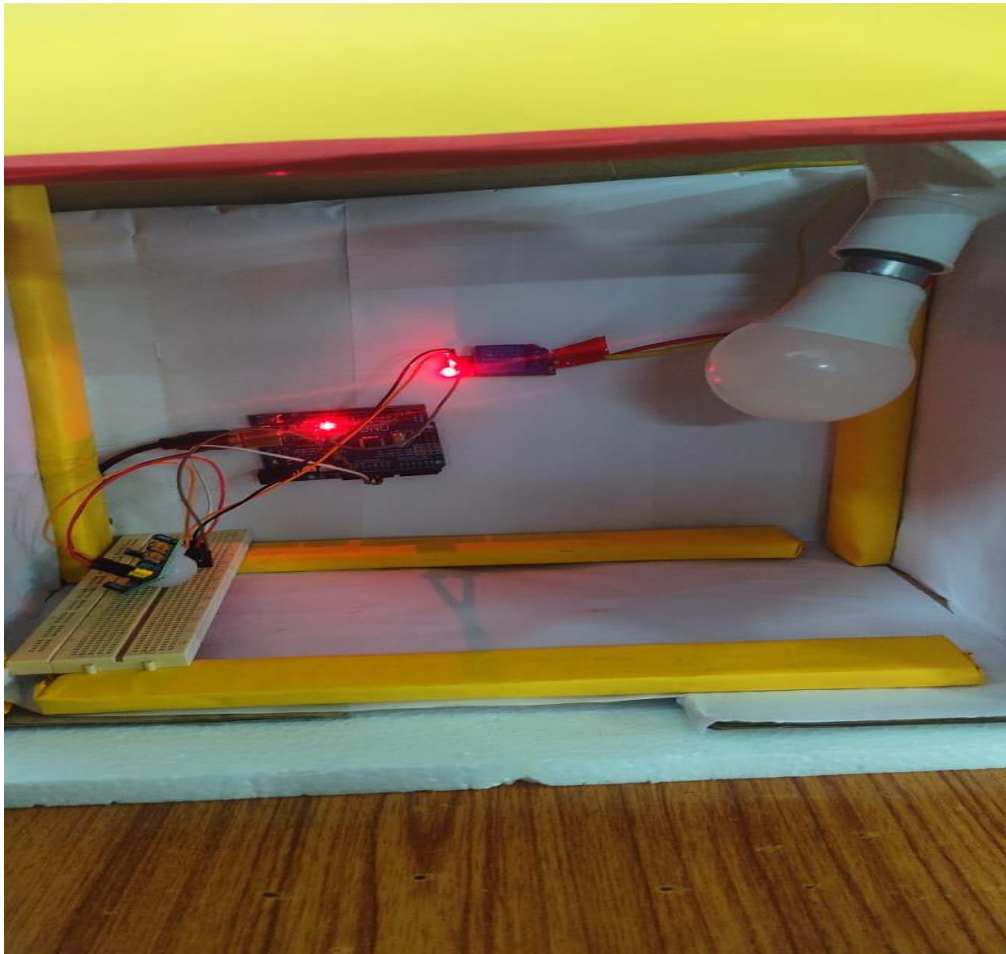
(a).Picture of the motion sensor light blinking

(b). Picture of the team members