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A Survey on Automatic Light Control using PIR Sensor

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Abstract: ***In This paper work PIR (Passive infrared) Motion Sensor Is used which is used as motion detector. If Any Person, Animal or Any Object Comes in the Range of the sensor. Then Automatic Light Switched on. This Can Also use in Automatic Room Light, When Any Person Enter in The Room Then Light Automatic Turn on. If there is No Any Movement or Motion Occur, Then Sensor Give LOW output and Turned Off Because There is No Any Input Of BASE terminal. When any Motion Occur, Then It Detects by Sensor And Its Output Is High. Because The Output Is HIGH, The Transistor Gets High input at BASE and it Turns ON and Relay is activated. As Relay is activates the Light connected with this will Switched ON***
Keywords: Arduino, PIR Sensor.

I. INTRODUCTION

Paper represents automatic lighting and design using PIR motion sensor. Using this we can minimize the consumption of electrical power. Low availability of Power is one of the most common problems in Bangladesh. With the help of the sensors we can overcome this shortage by minimizing the wastage of electrical power or saving our generated power. PIR is the type of sensor that gives us signal when anything crosses its rays. It is an electronic sensor that calculates infrared (IR) light radiating from objects in there filed. It is a chipper device used to detect a change in motion in its surroundings within different range of radius. A PIR-motion detector is used to sense movement of person, animals, and other objects. It can also helpful in the security systems. In many offices there are unnecessarily lights kept switched on for the whole night and day. But if we use the sensor then only when the motion will detect it give signal and the lights will be switched on. The whole process can be controlled by using micro controller.

II. RELATED WORK

Jaeseok Yun and Sang-Shin Lee have propose that, the distance of the body from the PIR sensor, the direction and speed of movement, the body shape and gait. In this paper, we present an empirical study of human movement detection and identification using a set of PIR sensors.

Saravana Kumar K , Priscilla P, Germiya K Jose , Balagopal G propose that, s using a PIR sensor to find the direction of movement by the concepts of polarization [1]. Another technique by using PIR sensors along with Symbolic Dynamic Filtering on seismic waves, from these seismic waves the features were extracted using SDF and checked if presence is of vehicle or animal/human.

III. COMPONANT

1) *PIR Sensor:* A PIR sensor is also called as passive infrared sensor it is an electronic sensor. That calculates infrared (IR) light radiating from objects in its field. They are most used in PIR-based motion detectors.

2) *Arduino Uno:* The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc.[2][3] The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.[1] The board has 14 Digital pins, 6 Analog pins, and programmable with the Arduino IDE.

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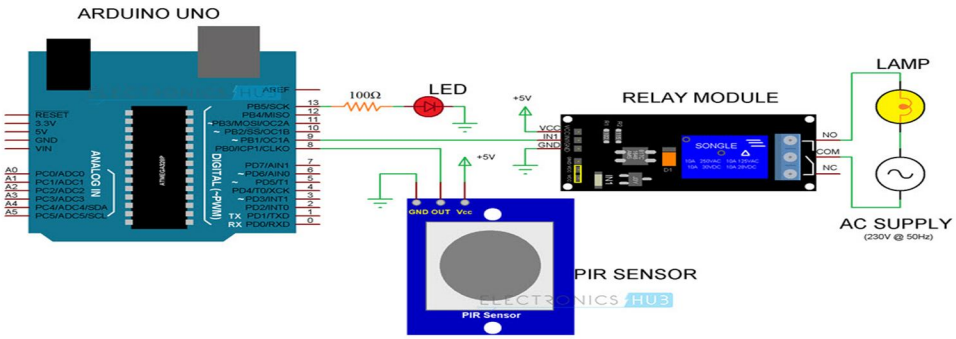
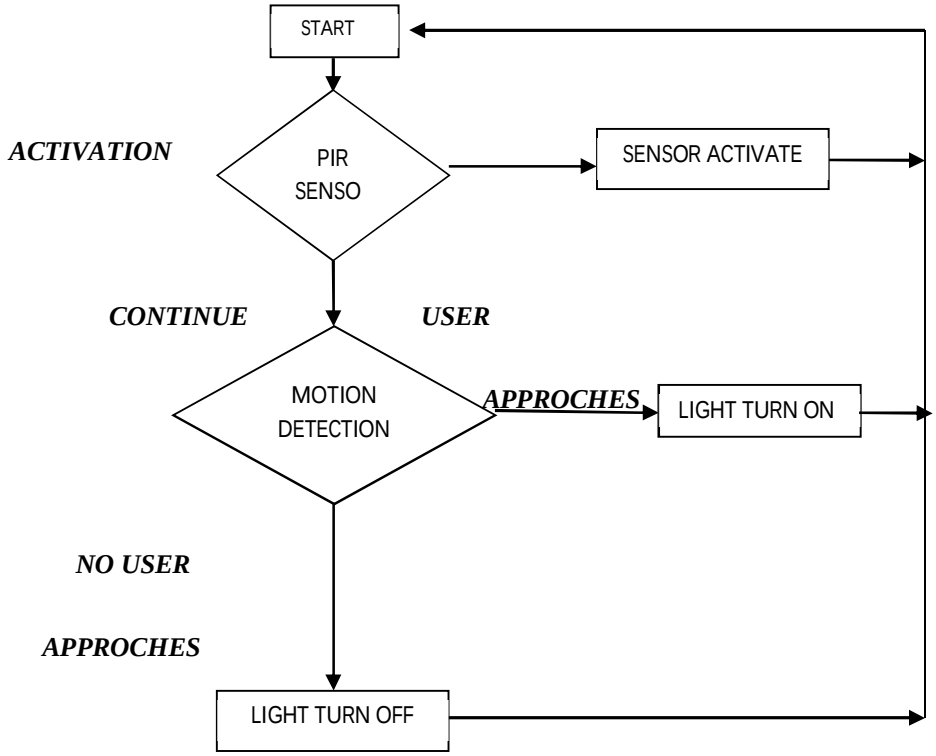
3) *Relay Module:* A Relay Module is a very useful component as it allows Arduino, Raspberry Pi or other Microcontrollers to control big electrical loads. We have used a 2-channel Relay Module in this project but used only one relay in it In order to control a single relay on the board; we need to use three pins of the relay module: VCC, GND

4) *Circuit Design*: PIR Sensor's Data OUT Pin is connected to Arduino's Digital I/O Pin 8. An LED is connected to pin 13 of Arduino to indicate whether the light is turned ON or OFF. The IN1 pin of the Relay Module is connected to Pin 9 of Arduino. A bulb is connected to mains supply through relay. One terminal of the bulb is connected to one wire of the mains supply. The other terminal of the bulb is connected to the NO (Normally Open) contact of the Relay Module.COM (Common) contact of the Relay is connected to the other wire of the mains supply. Be careful when connecting this part of the project



IV. FLOWCHART



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V. PROPOSED WORKING

Initially, if there is no human movement means the PIR Sensor doesn't detect any person and its OUT pin stays LOW. When the person enters the room, the infrared radiation in the room is detected by the PIR Sensor. As a result, the output of the PIR Sensor becomes HIGH. Since the Data OUT of the PIR Sensor is connected to Digital Pin 8 of Arduino, whenever the pin is HIGH, Arduino will activate the relay by making the relay pin LOW (as the relay module is an active LOW module).This will turn the Light ON. The light stays turned ON as long as continuously movement detected by the sensor. If the person takes leave from the room, the IR Radiation will become stable (there will be no change) and hence, the Data OUT of the PIR Sensor will become LOW. This will makes the Arduino to turn OFF the relay (the relay pin is HIGH) and the room light will be turned OFF.

VI. CONCLUSION

From this paper work we conclude that an approach is taken to control automatic light with the help of various devices and the user was informed about the entry of the person through a PIR SENSOR at the receiver. We have done coding in such a way that little movement of the human is detected by the sensor. We have put some time delay and adjusted the time period for the sensor output for the exact detection.

VII. FUTURE SCOPE

In our system we are taking decision based on the presence of human being but we can also added LDR (Light Dependent Resistor) Sensor and Temperature sensor for better working of the system. This system can be also interfaced with the wire. Applications of our device are listed below

A. It can be used in college and schools (Turn of lights and fans when no one is there),

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[2] Jaeseok Yun and Sang-Shin Lee, "Human Movement Detection and Identification Using Pyroelectric Infrared Sensors" Sensors 2014.
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It can be used for home security purpose also we can fit at the main door of the house.
It can also used in offices.

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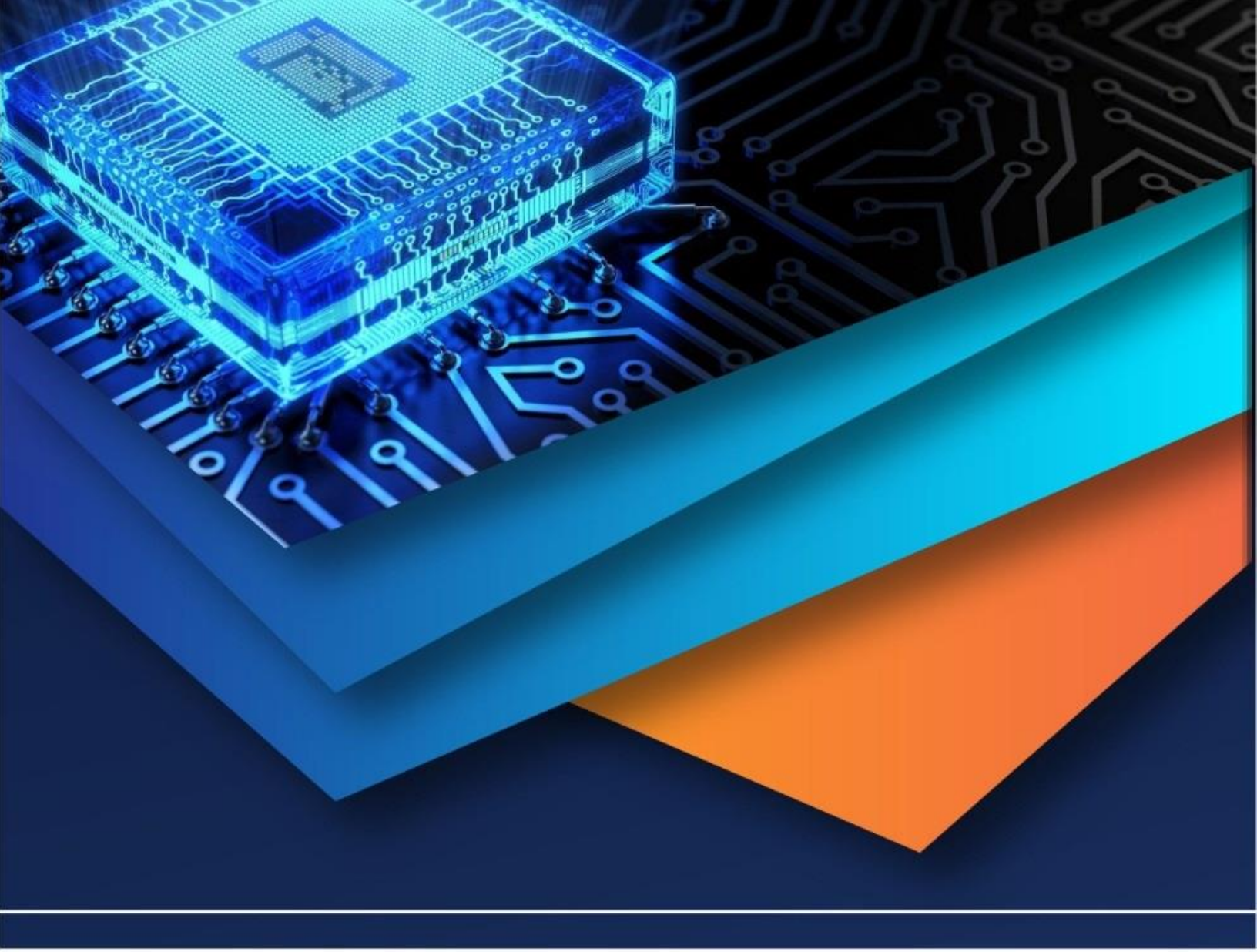

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