MINI PROJECT ON

MOTION SENSOR OF LIGHT USING ARDUINO

Submitted to the GITAM in partial fulfilment of
the requirements for the VII Semester of

Bachelor of Technology
In
COMPUTER SCIENCE AND ENGINEERING
By

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DECLARATION

I declare that the mini project report has been done by me under the supervision of **M.BHAVANI** Department of CSE. The report has not been submitted to any other Institute/University.

DATE: 16-10-2019

Signature of the Student

(Name of the Student)

NIKHIL RACHARLA

CERTIFICATE

This is to certify that the mini project report entitled "**MOTION SENSOR OF LIGHT**", submitted by **NIKHIL RACHARLA, Reg No:1215316746** in the Department of Computer Science and Engineering, GITAM (Deemed to be University) for the VII semester of BTech in Computer Science and Engineering is carried out under my supervision.

Date: 16-10-2019

Signature of the Supervisor

M.BHAVANI

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-NIKHIL RACHARLA

INTRODUCTION

In countries like Bangladesh, wasting of electricity can

In many countries, wasting of electricity can make drastic effect on energy infrastructure. In many cases we found that people just forget to put off the lights before they are leaving. Automatic lighting system is a system where the light will become ON sensing if there is any movement in the room. If there is any movement in the room the light will become ON. If there is no movement in the room for a long time the light will be OFF. We can use any kind of electrical equipment instead of light. Lots of other things are producing day by day for this purpose.

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In this project we have tried to make a model that suits for our country. The systems can be very useful in both power savings and also in saving our valuable things from the thieves. As this is an automatic action no human is needed to operate it. We have used microcontroller to do all the things. We have made the program and then burnt it in the microcontroller. As this is a prototype model, the expenditure is not exact like the professional ones. In case of professional works this model can be implemented and designed with keeping concern about the costs, efficiency and also the outlook. We just want to show here that if we use the model in our daily life it can be helpful not only for the users but also for the whole country. It is not only saving power from being wasted but also saving the additional electricity bills of the consumers

OBJECTIVE

A Light Sensor is a device that detects light. It generates an output signal that is proportional to the intensity of light. A light sensor measures the radiant energy present in the wide range of frequencies in the light spectrum. Some of the common frequencies are infrared, visible and ultraviolet. A Light Sensor is also called as Photo Sensor or Photo electric Sensor as it converts light energy or photons in to electrical signals. There are different types of light sensors for different applications. A Photocell or Photo Resistor is the common type of light sensor. A photo resistor changes its resistance when light is incident on it. Hence, a photo resistor is also called as Light Dependent Resistor or LDR.

Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

The Arduino platform has become quite popular with people just starting out with electronics, and for good reason. Unlike most previous programmable circuit boards, the Arduino does not need a separate piece of hardware (called a programmer) in order to load new code onto the board -- you can simply use a USB cable. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program. Finally, Arduino provides a standard form factor that breaks out the functions of the micro-controller into a more accessible package.

When there is no light, the resistance of LDR is very high. When there is light incident on the LDR, its resistance decreases. There are a wide range of applications of light sensors.

METHODOLOGY

I.EXISTING SYSTEM

Nowadays without electricity we cannot imagine our daily life because electricity has become a necessity for all, without which day-to-day life chores & daily activities become stand still. Due to the depletion of non-renewable resources, conservation of mandatory and by doing so we can reduce electricity bills as well. We know that energies like wind energy, solar energy and hydro energy are called renewable energy sources which are renewable in nature. Therefore, utilization of these resources for power supply is the best possible way of producing, conserving and renewing energy, which is advantageous as it is pollution free, affordable, and free from environmental impacts.

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DISADVANTAGE OF EXISTING SYSTEM

Disadvantage**s** and challenges in using LEDs. LEDs are currently more expensive, price per lumen, on an initial capital cost basis, than more conventional lighting technologies. The most common design of a heat sink is a metal device with many fins, which conducts the heat away from the LED.

PROPOSED SYSTEM

On the other hand, the energy resources like petroleum, coal, natural gas, uranium and propane are called non -renewable resources, because their supplies are limited. Many environmental effects and day-by-day depleting energy resources warn us to save energy by using automatic room controller an Energy efficient lighting systems.

Nowadays the wastage of electricity has become a routine thing for us, and the problem has become frequent at homes, schools, and colleges and even in industries. Sometimes we notice fans and lights keep on working even in the absence of people. This often happens in homes, offices and public places due to utter negligence of the inmates.

ADVANTAGE OF PROPOSED SYSTEM

It is easy to integrate with lighting system such as automatic lighting system. It is used for energy consumption or energy management by automatic control of brightness level in mobile phones and auto ON/OFF of street lights based on ambient light intensity. LDR (i.e. photo resistor) based light sensors are available in different shapes and sizes.

Light sensors need small voltage and power for its operation. Photo resistors are lower in cost, bi-directional and offer moderate response time. Photodiodes offer quick response time, lower in cost and provide digital output. Phototransistors are very fast and provide immediate output compare to photo resistors. Phototransistors generate high current compare to photodiodes.

Components Required

- **Arduino UNO**

Arduino Uno is a microcontroller board based on the A Tmega 328P has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 Analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. You can tinker with your UNO without working too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.

"Uno" means one in Italian and was chosen to mark the release of Arduino Software (IDE) 1.0. The Uno board and version 1.0 of Arduino Software (IDE) were the reference versions of Arduino, now evolved to newer releases. The Uno board is the first in a series of USB Arduino boards, and the reference model for the Arduino platform; for an extensive list of current, past or outdated boards see the Arduino index of boards.

PIR SENSOR

A passive infrared **sensor** (**PIR sensor**) is an electronic **sensor** that measures infrared (IR) light radiating from objects in its field of view. They are most often used in **PIR**-based **motion** detectors.

PIR sensors are commonly called simply "PIR", or sometimes "PID", for "passive infrared detector". The term *passive* refers to the fact that PIR devices do not radiate energy for detection purposes. They work entirely by detecting infrared radiation (radiant heat) emitted by or reflected from objects.

LED BULB

An **LED lamp** or **LED light bulb** is an electric light for use in light fixtures that produces light using one or more light-emitting diodes (LEDs). LED lamps have a lifespan many times longer than equivalent incandescent lamps, and are significantly more efficient than most fluorescent lamps, with some LED chips able to emit up to 303 lumens per watt (as claimed by Cree and some other LED manufacturers).

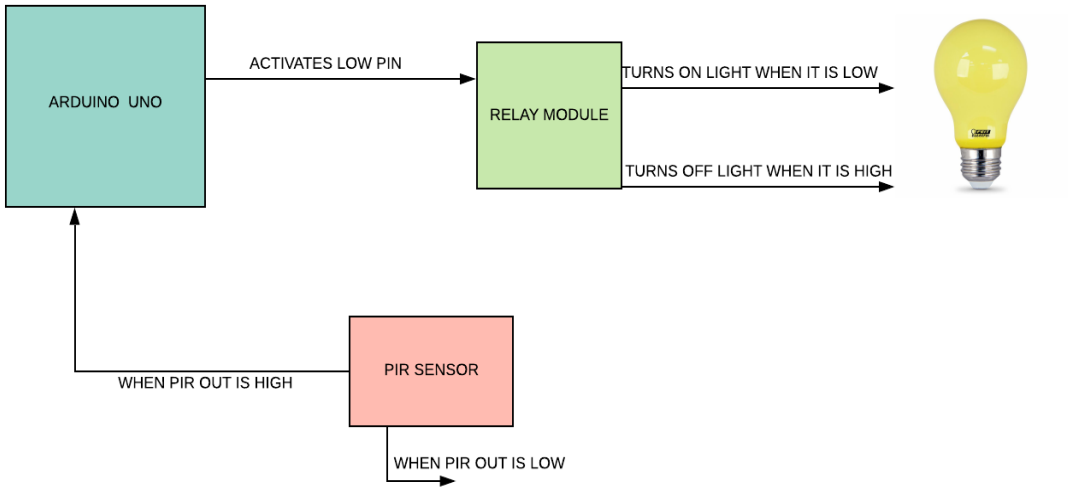
Connecting Wires

A **wire** is a single, usually cylindrical, flexible strand or rod of metal. Wires are used to bear mechanical loads or electricity and telecommunications signals. Wire is commonly formed by drawing the metal through a hole in a die or draw plate. Wire gauges come in various standard sizes, as expressed in terms of a gauge number. The term *wire* is also used more loosely to refer to a bundle of such strands, as in "multi stranded wire", which is more correctly termed a wire rope in mechanics, or a cable in electricity.

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 4-channel Relay Module in this project but used only one relay in it. The relay module used in this project is shown below.

WORKING



The Automatic Room Lights using Arduino and PIR Sensor is a simple project, where the lights in the room will automatically turn on upon detecting a human motion and stay turned on until the person has left or there is no motion.

Initially, when there is no human movement, the PIR Sensor doesn't detect any person and its OUT pin stays LOW. As the person enters the room, the change in 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 it becomes 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 there is movement in front of the sensor.

If the person takes a nap or leaves 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 in turn will make the Arduino

to turn OFF the relay (make the relay pin HIGH) and the room light will be turned OFF.

RESULTS AND COMPARISON

The PIR SENSORS range is affected by

1. The setting of sensitivity jumper on sensor.

2. The thermal properties and size of nearby objects.

3. Environmental conditions like ambient temperature and light resources.

CONCLUSION

This work presents the automatic lighting and security system using motion sensors. We have shown how effectively the power is saving because of using motion sensors. If we just use the alarms instead of lights it will be good enough to work as a security system. The design for the both is same. We have shown that using PIR sensors we can save both money and our generated power on a large scale which ultimately helps the power distribution. So it is an effective and very time demanding project for our country as well as others.