Visvesvaraya Technological University

Belagavi

A Mini Project Report

on

AUTOMATIC STREET LIGHT

Submitted by

KEERTHANA P	**1NH20EC063**
K LAKSHMI	**1NH20EC069**
LIKITHA R	**1NH20EC073**
MONIKA M	**1NH20EC083**

In partial fulfillment for the award of the degree of

BACHELOR OF ENGINEERING

IN

ELECTRONICS & COMMUNICATION

NEW HORIZON
COLLEGE OF ENGINEERING
New Horizon Knowledge Park, Ring Road, Marathalli
Autonomous College Permanently Affiliated to VTU, Approved by AICTE & UGC
Accredited by NAAC with 'A' Grade, Accredited by NBA

NEW HORIZON
COLLEGE OF ENGINEERING
New Horizon Knowledge Park, Ring Road, Marathalli
Autonomous College Permanently Affiliated to VTU, Approved by AICTE & UGC
Accredited by NAAC with 'A' Grade, Accredited by NBA
BENGALURU-560103

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CERTIFICATE

Certified that the Mini project entitled "**AUTOMATIC STREET LIGHT**" is carried out by **KEERTHANA P** bearing **1NH20EC063, K LAKSHMI** bearing **1NH20EC069, LIKITHA R** bearing **1NH20EC073, MONIKA M** bearing **1NH20EC083**, Bonafede studentsof NHCE, Bengaluru in partial fulfillment for the award of Bachelor of Engineering in Electronics and Communication of the Visvesvaraya Technological University, Belagavi during the year 2020-21. It is certified that all corrections and suggestions indicated for Internal Assessment have been incorporated in the report deposited in the department library. The mini project report has been approved as it satisfies the academic requirements in respectof the mini project work prescribed for the said degree.

Signature of the Guide	Signature of the HoD
Mrs Baby Chitra	Dr. Sanjeev Sharma
Assistant Professor	Professor & HoD
Department of ECE	Department of ECE
NHCE, Bengaluru	NHCE, Bengaluru

External Viva

Name of the Examiners	Signature with Date
1.	1.
2.	2.

page of the plagiarism report

ACKNOWLEDGEMENT

With immense pleasure and deep sense of gratitude, I wish to express my sincere thanks to my supervisor **MRS. BABY CHITRA**, Assistant Professor, Department of Electrical Engineering, New Horizon College of Engineering, without her/his motivation and continuous encouragement, this miniproject would not have been successfully completed.

I am grateful to the Chairman of New Horizon Educational Institution. **Dr. Mohan Manghnani** for motivating me to carry out research in the NHCE and for providing me with infrastructural facilities and many other resources needed for my project work. I express my sincere thanks to **Dr. SANJEEV SHARMA** HoD, Department of Electronics & Communication Engineering, New Horizon College of Engineering for his kind words of support and encouragement.

I wish to extend my profound sense of gratitude to my parents for all the sacrifices they made duringmy project and providing me with moral support and encouragement whenever required.

Date:

Place:

KEERTHANA P

K LAKSHMI

LIKITHA R

MONIKA M

ABSTRACT

At present everything in world seeks for automation and faster movement of work and try completing the work with less human power and less time consumption. One of the technique used by automation for Lighting system is **'Automatic Street Lighting System using PIR Sensor'.** This technique helps in detecting vehicle movement at a very short range of distance and glows When the vehicle approaches nearby and with a delay time of 2 mins after the vehicle passes . This way it helps in saving the electricity wasted by street lights which glows unnecessarily during day time too.

We analyzed such technique which was cost effective and less human power consumption and developed a circuit diagram for the same and got successful simulation. We have used Three PIR sensors, one at the entry and one at the crossing and one at the exit in order to detect the presence of vehicle movement. LED are used to act like street lights which glows when the PIR Sensor detects the motion of vehicles.

PIR sensor is the main component for our project that made our project even easier due to motion of vehicles, and for simulation we used **PROTEUS SOFTWARE.** We have made a model to bring out the natural effect of how the project exactly works. We explained the working and construction and program description in detail.

CONTENTS

LIST OF FIGURES

CHAPTER-1
INTRODUCTION

We all have heard about the importance of lighting on roadside in the night-times. It is used to brighten our surroundings and for safety reasons. It is necessary to have good quality lightings. It is obvious that we can't find roadways safe to drive at night without proper lightings. Having street lights is beneficial and it helps to brighten the place at night. It helps the police to increase safety and security for the people travelling in the night. It facilitates smooth traffic flow. It promotes the use of public interaction during the night hours.

Fig. 1.1

To promote energy saving and emission reduction and effectively guide the healthy and rapid development of semiconductor lightning applications, the People's Ministry of Science and Technology has rapidly applied LED lamps in street lightning projects in major cities.

CHAPTER-2

LITERATURE REVIEW

1. Ritam Sahu 2. Moyuri Shil 3. Rimpi Datta 4. Piya Sarcar	1. Arduino Uno 2. IR Sensor Module(2piece) 3. 10mm LED (4Piece) 4. Power Supply 5. Male to Male and Male to Female jumper wire	We can use this street light control circuit in normal roads, highways. Express ways and all in parking areas of malls, hotels etc. This is lighting system which implements all LED lights, so that the maintenance cost can be reduced as the durability and lifespan of LED is greater than the neon-based light which are normally used in all street lights.This saves energy as it automatically turns ON or OFF. This is very beneficial to use
1. Prashant Kumar 2. Shivaraj S 3. Hiremath G V 4. Sandeep 5. Santosh kumar 6. Javalagi 7. Dr. Venkata Siva Reddy	1. Light dependent resistor (LDR) 2. Relay 3. GSMIR Sensor	We can draw the conclusion that the design target has been fulfilled by the project's hardware and software architecture. The working prototype of a street lighting automation was created using the Arduino uno. The energy can be saved by the usage of LDR and IR sensor as the input, since LED turns ON only when it is dark and on the movement of objects, thereby decreasing the usage of power consumption by street light. It also has a fault detecting system which can detect the fault and sends a warning message to the controller.

Yashaswini.N, Raghu .N Yashaswini .S Prathib Kumar .G	1. Transformer 2. Rectifier3. 3. Row of Leads treated as street lights 4. Asm/c program 5. IR receiver 6. IR transmitter 7. 8051 series MC 8. Regulator	The possibilities are numerous and explored further. If technology can be put into practical things we can save lots of energy use and we can have a cleaner, greener , safer, and brighter future . This can also be utilized for security surveillance in corporate buildings, business centers etc., The initial investment cost and election may be disadvantage, but with bulk production if module the overall cost of investment can be reduced further. This project can also help to aid navigation . It will be lot of helpful for future.
Rezwan us Saleheen Saiful Islam Abu Salman Shaikat Md. Rezwanur Rahman	1. Microcontroller 2. LDR 3. IR sensor 4. Buzzer 5. Ultrasonic sensor 6. Power supply	The extravagance of electrical energy and human efforts is a common context while using manual switching of streetlights. In m of cases, the streetlights remain ON during evening, night, even daylight the lights manually are switched OFF. This system is designed in such a way that it does not need any human support to ON and OFF the light. The entire system includes Raspberry PI acts as the brain, which is the main controller which controls the whole system. s. The proposed automated streetlight system provides an opportunity to diminish this embezzlement of energy while ensuring precaution against phenomena like reckless driving

CHAPTER-3

EXISTING SYSTEM

The street light systems nowadays are needed to be switched ON and OFF manually. The existing street light System has high power consumption and its maintenance is also quite expensive. Manpower is mainly required to handle the functioning of the Existing Street light System. The current system which is commonly used in all the streets of the street system has cost a heavy electricity loss the whole night. suppose the street light is not stopped after the night, the loss will continue throughout the day. And also the street light is not necessary when there is no movement in the streets. A number of street light control systems have been developed to reduce the consumption of energy many protocols have been developed and also compatible hardware for most of the lighting.

The drawbacks of the existing street light system are:

- Today street lights are not flexible
- All the controlling systems are manual
- The main problem is that can't be easily handled in remote areas
- Small manual mistakes can result in huge power wastage

CHAPTER-4

PROPOSED SYSTEM

This paper proposes a method that is effective in controlling the wastage of electricity due to streetlights. Due to automatic switching on and off of the street light, it reduces the manual effort. The electricity wastage can be reduced by glowing the light based on vehicle movements.

During the nighttime, it also helps pedestrians to walk with the street light as they glow on detection of the motion/obstruction.

CHAPTER-5
HARDWARE & SOFTWARE SPECIFICATIONS

LED (Light Emitting Diode)

Fundamentally, LEDs are simply modest lights that fit effectively into an electrical circuit. However, in contrast to standard glowing bulbs, they don't have a fiber that will wear out, and they don't get particularly hot. They are lit up exclusively by the development of electrons in a semiconductor material, and they keep going similarly up to a standard transistor.

The life expectancy of a LED outperforms the short existence of a brilliant bulb by a great many hours. Little LEDs are as of now supplanting the cylinders that light up LCD HDTVs to make significantly more slender TVs. In our project LEDs are utilized just to legitimize when the activating yield is given by the LDR. When the proximity sensor gives yield the LED turns on.

Fig 1.2

The applications of the LED are found in all places now in entire world.

In almost all the display components uses LED.

1. The LEDs are very cost effective
2. LEDs are easily available in the market.

The use of LED in our project: We have used 5 LED indicators along with LED strips. The LED indicators are used before the status of vacant lots to the user. But

after taking entry, it might be difficult for the user to remember the vacant slot. To solve the issue, LED strips are used which will navigate user to park the car at a vacant slot.

We have used 5 LED indicators along with LED strips. The LED indicators are used before the status of vacant lots to the user. But after taking entry, it might be difficult for the user to remember the vacant slot. To solve the issue, LED strips are used which will navigate user to park the car at a vacant slot.

Battery:

Fig 2.1

HI WATT 9V battery is a commonly used and9v portable battery.it has a high capacity and low-cost solution for many electronic devices. The battery can be used for powering toys, LEDs torch, etc .it is generally connected by using a battery snap connector to breadboard.

Specifications:

Battery type: zinc-carbon battery

Dimensions:26.5mm*48.5mm*17.5mm

System: zinc carbon

Operating temperature range :- 20 to+85

It’s very simple to use this battery in any circuit, some important precautions must be taken while using this battery.

PIR (Passive Infrared Sensor)

The infrared light radiated from the objects is measured by the PIR sensor. PIR-based motion detectors mainly use PIR sensors.

The typical pin configuration of PIR sensor is shown below. The PIR sensor consist of 3 pins,

Fig 2.0

Pin1 corresponds to the drain terminal of the device, which is connected to the positive supply 5V DC.

Pin2 corresponds to the source terminal of the device, which connects to the ground terminal via a 100K or 47K resistor. The Pin2 is the output pin of the sensor. The pin 2 of the sensor carries the detected IR signal to an amplifier from the

Pin3 of the sensor connected to the ground.

PIR sensor is used to detect the movement of huma/animal in a particular range. PIR is made of a pyroelectric sensor. This pyroelectric sensor can detect different levels of infrared radiation. The detector itself does not emit any energy but passively receives it.

It detects infrared radiation from the environment. When there is infrared radiation from the human body particle with temperature, a sudden electrical signal is generated by the pyroelectric device focusing on the optical system.

When a human body or any animal passes by, it intercepts the first slot of the PIR sensor. Ta positive differential change is caused between the two bisects. When a

human body leaves the sensing area, a negative differential change is generated by the sensor between the two bisects.

Outdoor passive infrared: The detection distance ranges from 10 meters to 150 meters.

Working and utilization of proximity sensor in our project:

These sensors are being used along the roads. It is a sensor able to detect the presence of nearby objects without any physical contact.

Whenever a vehicle is entered through the road the sensor sense and it gives an output that is indicated by LED the presence of the vehicle and similarly when the car has come out through the exit gate the sensor present their sense and gives the output and that also is indicated using LED. It is a cost-effective sensor and easily usable.

If either of the Sensor has failed to detect the cars in some unfavorable conditions then there will be a wrong count and the lights may not glow. Care has to be taken properly for these sensors.

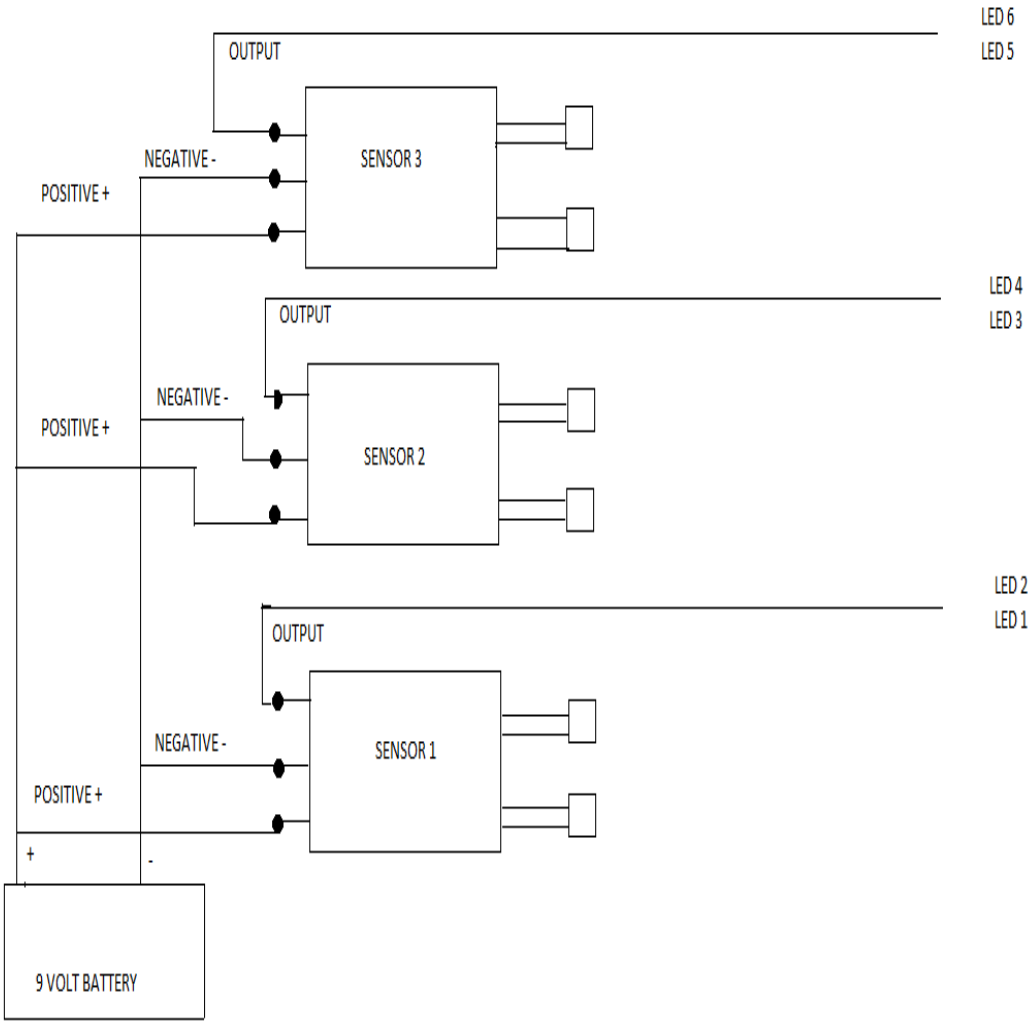
Resistors

Fig 2.2

Resistors are the electronic components which have a specific electrical resistance. The flow of electrons is limited through the circuit by the resistance of the resistor. They are passive components, i.e, they only consume power (and can't generate it). Resistors are added to circuits to complement active components like op-amps, microcontrollers, and other integrated circuits. Commonly resistors are used to limit current, divide voltages, and pull up input lines.

CHAPTER-6

BLOCK DAIGRAM



CHAPTER-7

WORKING

The aim of this project is to design a street light control system that automatically turns ON and OFF. The automatic Street light system is a very effective system for saving energy sources. The operation is very simple by the working of sensors and LEDs.

When there is a need for light, then it automatically turns ON. When the darkness arises, the sensors start getting activated and switch ON and when there is light i.e. daytime the street light turns OFF. The street light ‘s sensitivity can also be adjusted.
Here the system senses vehicle movement using the PIR sensors and turns ON the light only when it is needed and at night when the vehicle passes by. Else the street lights are switched off when it is not needed. This system needs no manual operation for switching ON and OFF. In our project, we have used LED as a symbol of the street light. We will only PIR sensors to control the street light system

CHAPTER-8

APPLICATIONS AND ADVANTAGES & DISADVANTAGES

Application:

1. Normal roads
2. Highways
3. Garden lights
4. Street lights
5. Parking areas like Mall's, Hotels etc…
6. Industrial lightings

Advantages:

1. In this circuit LED bulbs are used. So, it is very low cost and it has more life span.
2. By using LED bulb's, we can save more energy
3. If the lights are automatically turned on and off.
4. Usage of energy is less and energy will be saved.
5. Low power consumption and low maintenance.
6. Less Man power required.
7. In this light sensor are used and it have high sensitivity

Disadvantages:

1. This system can be used only for one way traffic .
2. If the components gets spoiled there is no autodetection for replacing it

CHAPTER-9

RESULT & CONCLUSION AND ITS FUTURE SCOPE

Conclusion:

This project basically depends on motion of the vehicle or pedestrian or any obstruction to the sensor, makes the street light glow. So, this way the electricity which gets wasted at night time even in the absence of vehicles, can de reduced. In the model which we created, we have shown with one-way traffic road. 2 LEDs per sensor helps in providing ample amt of light for vehicles to travel. Hence, the purpose of making a automatic street light that helps in saving electricity has been completed successfully.

Future Scope:

Hence, we conclude that this project saves energy if construction in a proper method.
Also, if the solar panels are used the electricity can be saved even, as it converts solar energy to electrical energy.
Streets are a must, especially in streets, beach side roads, roads in hilly region, highways in mountain region etc., where danger of missing the path and also accidents takes place. The existing system, overcomes this criteria but with a drawback of wasting electricity. So, if this project gets implemented, that drawback can also be avoided.

CHAPTER-10

REFERENCE

1. Street light glow on detecting vehicle movement using sensors S. Suguna, R. Sinduja, T. Sowmya - Journal for advance of 2014 Kresttechnology.com
2. Automatic street light control by detecting vehicle movement P Kumar academia.edu
3. Street light glows on detecting vehicle movement using Arduino uno International journal of 2019 R. Sahu , M.shila, R.Datta, P.Sarcar Papers.ssro.com
4. Automatic street light system using lora wireless communication CNS soujanya In the year 2018 ise.ait.ac.th

5. Automatic street light control by detecting vehicle movement N. Yashaswini, N. Raghu, S. Yashaswini in the year 2018 ieeeexplore.ieee.org