A MINI PROJECT REPORT

ON

"AUTOMATIC STREET LIGHT"

Submitted in the partial fulfillment of the requirements for

The degree of

BACHELOR OF ENGINEERING IN COMPUTER ENGINEERING

By

1) OMKAR DAYANAND BHISE
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UNDER THE GUIDANCE OF

Dr. Anjali Dadhich.

Department of Computer Engineering
Saraswati College of Engineering, Kharghar, NaviMumbai
University of Mumbai

2022-23

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To be universally accepted as autonomous center of learning in engineering education and research.

Mission

- To educate Students to become responsible & quality technocrats to fulfill society and industry needs.
- To nurture student's creativity and skills for taking up challenges in all facets of life.

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CERTIFICATE

*This is to certify that the requirements for the project report entitled "**Automatic Street Light** " have been successfully completed by the following students:*

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In partial fulfillment of Sem –VI , **Bachelor of Engineering of Mumbai University in Computer Engineering** of Saraswati college of Engineering , Kharghar during the academic year 2022-23.

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PROGRAM EDUCATIONAL OBJECTIVE's

1) To embed a strong foundation of Computer Engineering fundamentals to identify, solve, analyze & design real time Engineering problem as a professional or an entrepreneur for the benefit of society.
2) To motivate & prepare students for lifelong learning & research to manifest global competitiveness.
3) To equip students with communication, team work & leadership skills to accept challenges in all facets of life ethically.

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1. Apply the knowledge of Mathematics, Science and Engineering Fundamentals to solve complex Computer Engineering Problems.
2. Identify, formulate and analyze Computer Engineering Problems and derive conclusion using First Principle of Mathematics, Engineering Science and Computer Science.
3. Investigate Complex Computer engineering problems to find appropriate solution leading to valid conclusion.
4. Design a software System, components, Process to meet specified needs with appropriate attention to health and Safety Standards, Environmental and Societal Considerations.
5. Create, select and apply appropriate techniques, resources and advance engineering software to analyze tools and design for Computer Engineering Problems.
6. Understand the Impact of Computer Engineering solution on society and environment for Sustainable development.
7. Understand Societal, health, Safety, cultural, Legal issues and Responsibilities relevant to Engineering Profession.
8. Apply Professional ethics, accountability and equity in Engineering Profession.
9. Work effectively as a member and leader in multidisciplinary team for a common goal.
10. Communicate effectively within a Profession and Society at large.
11. Appropriately incorporate principles of Management and Finance in one's own Work.
12. Identify educational needs and engage in lifelong learning in a Changing World of Technology.

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DEPARTMENT OF COMPUTER ENGINEERING

PROGRAMME SPECIFIC OUTCOME

1) Formulate and analyze complex engineering problems in computer engineering (Networking/Big data/ Intelligent Systems/Cloud Computing/Real time systems).
2) Plan and develop efficient, reliable, secure and customized application software using cost effective emerging software tools ethically.

DECLARATION

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included. I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

1. Omkar Bhise
2. Anant Bhosale
3. Prasad Minde
4. Hritika Shet

Date:

ACKNOWLEDGEMENT

After the completion of this work, words are not enough to express feelings about all those who helped us to reach goal.

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1. Omkar Bhise
2. Anant Bhosale
3. Prasad Minde
4. Hritika Shet

ABSTRACT

This venture goes for planning and executing the propelled advancement in inserted frameworks for vitality sparing of road lights. As of now we used manual framework i.e In night the road lights will be ON in the night prior and turned OFF in following day morning. Be that as it may, the real planning for these traffic lights would be exchanged to ON condition when there will be is total obscurity. Here, dissipation of power occurred up to a specified degree. Result of this, we have wastage of power. Additionally, physical operation is completely absent in proposed lighting framework. This New framework give an answer for vitality sparing. This is accomplished by detecting and moving toward a vehicle utilizing an transmitter of InfraRed; and a Receiver which is made with with infrared. Simultaneous detection of sensor developmental transmit the information for a microcontroller which conjointly switching ON light Essentially when the vehicle or a deterrent leaves the Light extort turning OFF when a sense is made by a sensor for each question in a meantime the status; (Turn ON / Turn OFF) of street light of the road got to from anyplace and buttoned up web. Venture actualized over; a savvy inserted framework which supervisions roadway lights in light identification of trucks/Busses/cars etc or some other obstructions.; On any occasion that snag will distinguished in the city inside required predefined time period naturally ON/OFF of light occurred as indicated by hindrance discovery & a similar data can be gotten to through web. By using the Internet, from any place we can get road light continuous data i.e (ON/OFF) whenever, required.

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CHAPTER 1

1.1 INTRODUCTION

One of the Major vitality of a city is street lighting. A savvy lighting framework for a road reduces the cost of city road lighting as good as approximately half; i.e 70%. A shrewd road lighting framework is a framework that modifies light yield in view of use and in habitance, i.e., mechanizing arrangement of walker versus cyclist, versus car. A keen road light system proposes the remote based framework; establishment to nearer path and regulate the road lights real vitality utilization and select suitable vitality utilization which reduces measures; with the help of power molding and regulation. The light controller system of the road must be offered shaft lights that consists of the microcontroller; special sensor and a module for remote sensing. The intelligent light controller system of road introduced a light shaft in a city can able to control road lighting; relying LED upon activity stream, convey information between every light in the road. The road light controller exchanged a piece of information to the available base station; utilizing remote innovation for screening the framework. One mode of framework operation will be directed to utilise auto and manual mode. At particular time, the framework control will be turned on and off the lights and also do likewise shift road; light force concurring based on our wish.

1.2 PROBLEM STATEMENT

Traditional street lighting systems are often inefficient, as they operate on fixed schedules regardless of actual lighting needs, leading to unnecessary energy consumption and maintenance costs.

Cities around the world are facing increasing energy consumption and environmental concerns due to inefficient and outdated street lighting systems. Traditional street lighting systems often lack the capability to adapt to changing conditions and remain illuminated even when not required, leading to unnecessary energy wastage, higher electricity bills, and increased carbon emissions. Additionally, poorly lit areas pose safety risks for pedestrians, cyclists, and motorists, potentially leading to accidents and crime.

To address these challenges, there is a need for a smart street light system that utilizes sensors and advanced technologies to optimize energy usage, reduce carbon footprint, and enhance safety. The smart street light system would leverage sensors to detect and analyze various parameters such as traffic density, ambient light levels, weather conditions, and pedestrian movement patterns. Based on this data, the system will intelligently adjust the brightness of street lights, turning them on or off as needed, and optimizing their operation to match the actual demand in real-time.

However, implementing such a smart street light system comes with its own set of challenges. These challenges may include selecting the right type of sensors and technologies, integrating them into existing infrastructure, ensuring robust and reliable communication networks for data transmission, developing intelligent algorithms for data analysis and decision-making, addressing privacy and security concerns, and managing the transition from traditional to smart street lighting systems.

Therefore, the extended problem statement for the smart street light system using sensors is to develop an innovative and efficient solution that can intelligently manage street lighting based on real-time data from sensors, addressing challenges such as sensor selection, integration, communication, algorithm development, privacy, security, and transitioning to a smart street lighting system. The solution should aim to significantly reduce energy consumption, minimize carbon emissions, improve safety in poorly lit areas, optimize resource utilization, and provide a sustainable and scalable approach to street lighting in smart cities of the future.

A Smart Street Light System can be implemented to tackle these problems. This System has been designed to improve energy efficiency and lower maintenance costs.

CHAPTER 2

2 METHODOLOGY

It reduces the manual effort by automating the streetlight on the basis of light intensity. The electricity wastage can be reduced by glowing the light on the basis of movement detection. Here three parts have been included under this topic for completed this study. Design architecture is the main block function for the proposed design. While, the hardware specification will detail out the components involved in this design from the sensor components until the controller selection. Software development based on the proposed design will be detail out in software part where the flow of the system operation will be detailed out elaborated

2.1 HARDWARE AND SOFTWARE REQUIREMENTS

Hardware Requirements:- Arduino Uno,
Breadboard,
Connecting wires
Led’s
LDR
10k register
IR sensor

Software Requirements:- Arduino Software**.**

2.2 DESIGN DETAILS

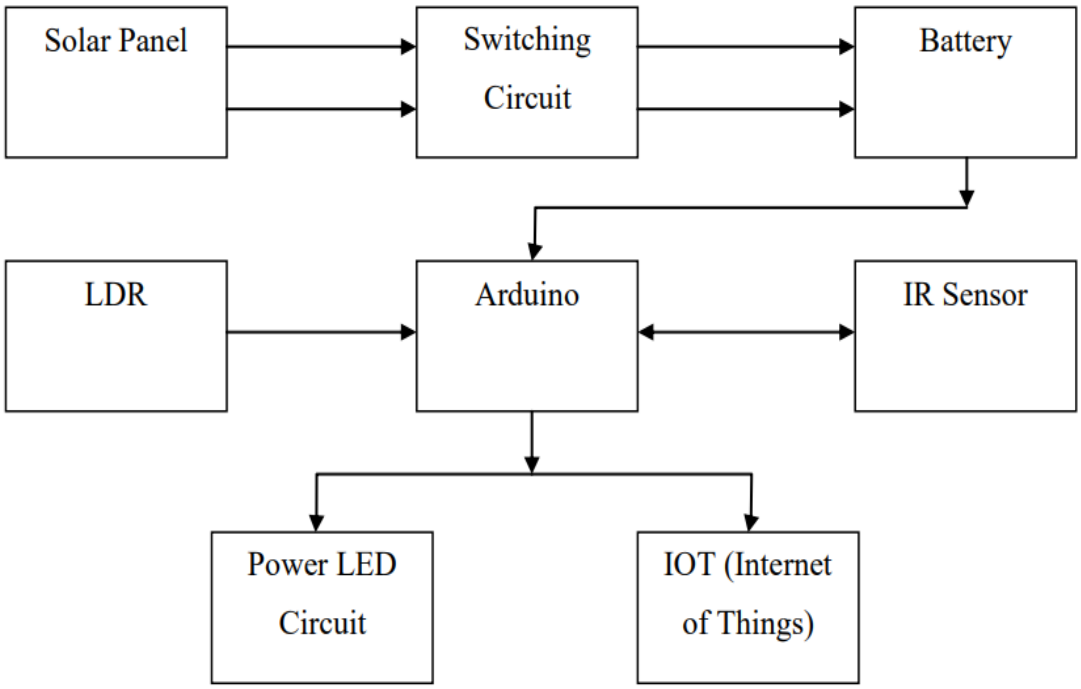


Fig 2.2.1: BLOCK DIAGRAM

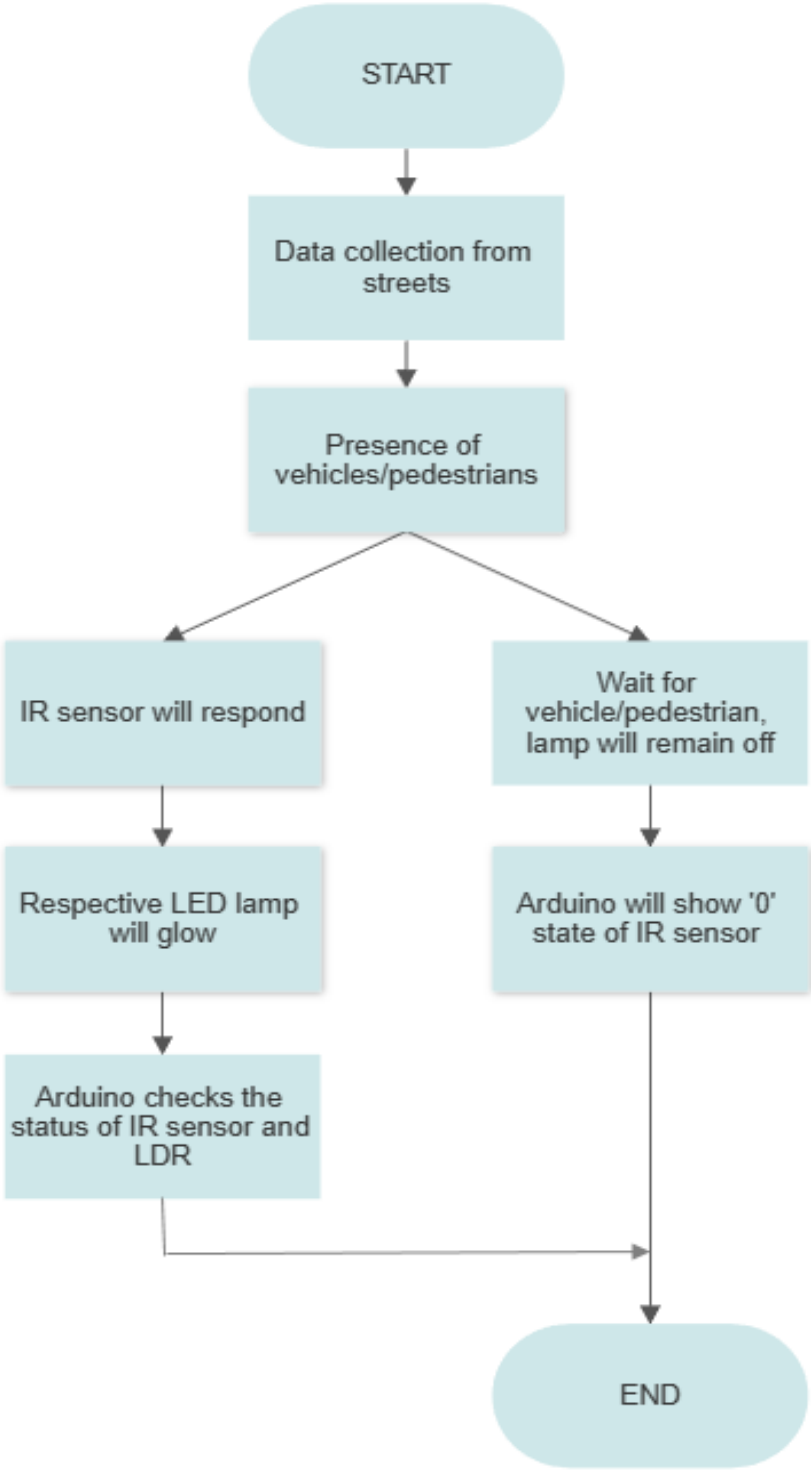


Fig 2.2.2 Flowchart

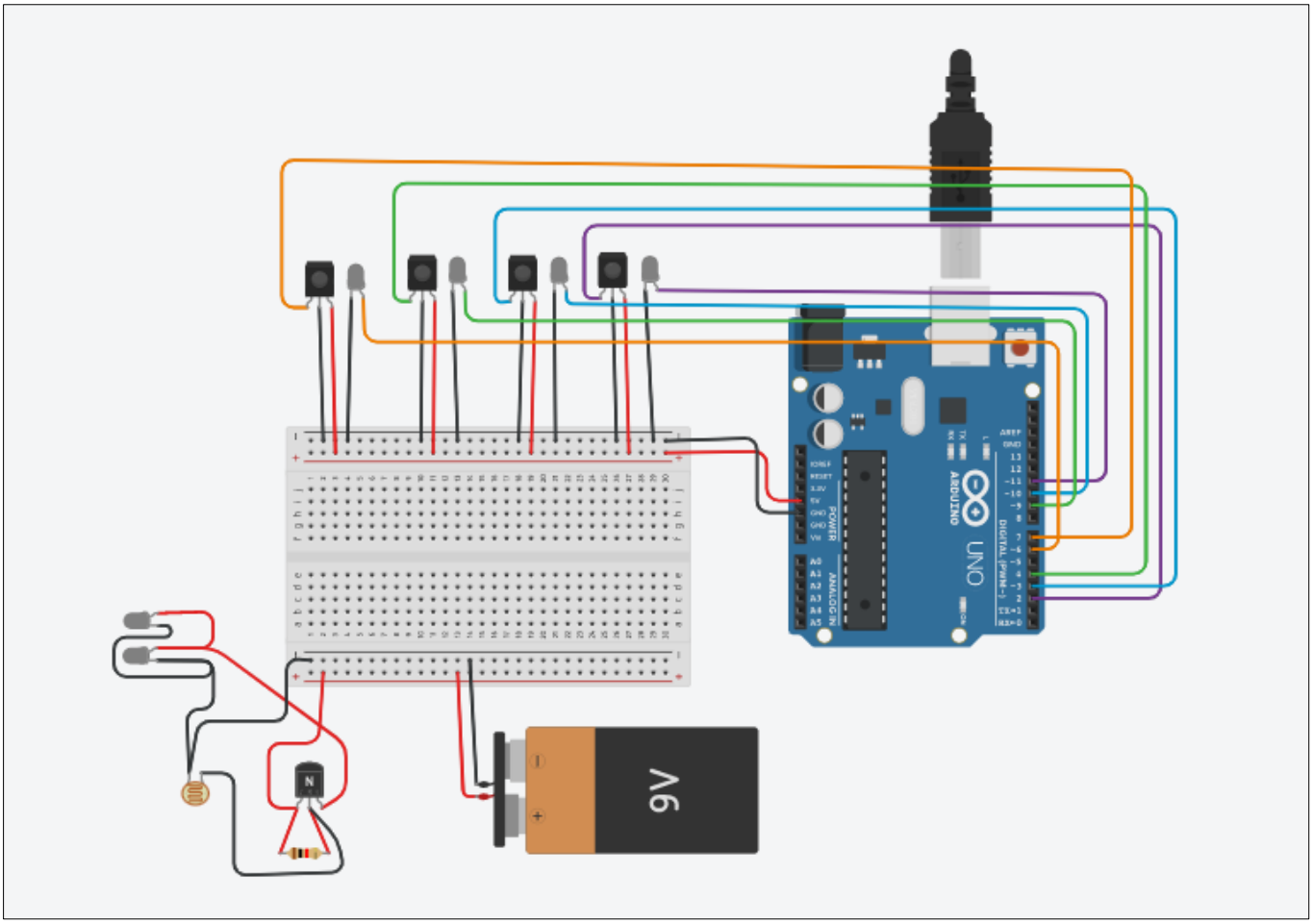


Fig 2.2.3 Circuit Diagram

CHAPTER 3

IMPLEMENTATION AND RESULTS

3.1 CODE

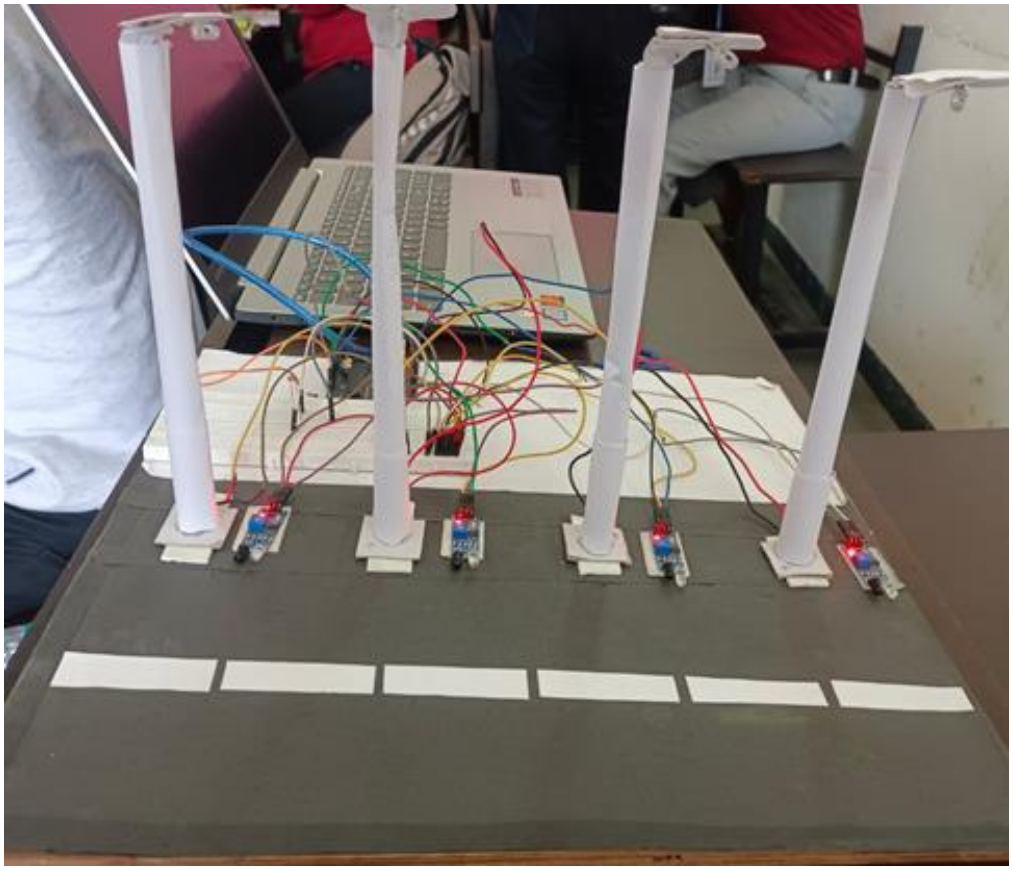
```
int led = 2;
int led1 = 3;
int led2 = 4;
int led3 = 5;
int led4 = 6;

int ldr = A5;

int ir = A0;
int ir1 = A1;
int ir2 = A2;
int ir3 = A3;
int ir4 = A4;

void setup()
{
  Serial.begin (9600);
  pinMode (led,OUTPUT);
  pinMode (led1,OUTPUT);
  pinMode (led2,OUTPUT);
  pinMode (led3,OUTPUT);
  pinMode (led4,OUTPUT);
  pinMode (ldr,INPUT);
  pinMode (ir,INPUT);
  pinMode (ir1,INPUT);
  pinMode (ir2,INPUT);
  pinMode (ir3,INPUT);
  pinMode (ir4,INPUT);

}
void loop()
{
 Serial.println(analogRead(A5));
  int ldrStatus = analogRead (ldr);
    if (ldrStatus <=500)
```

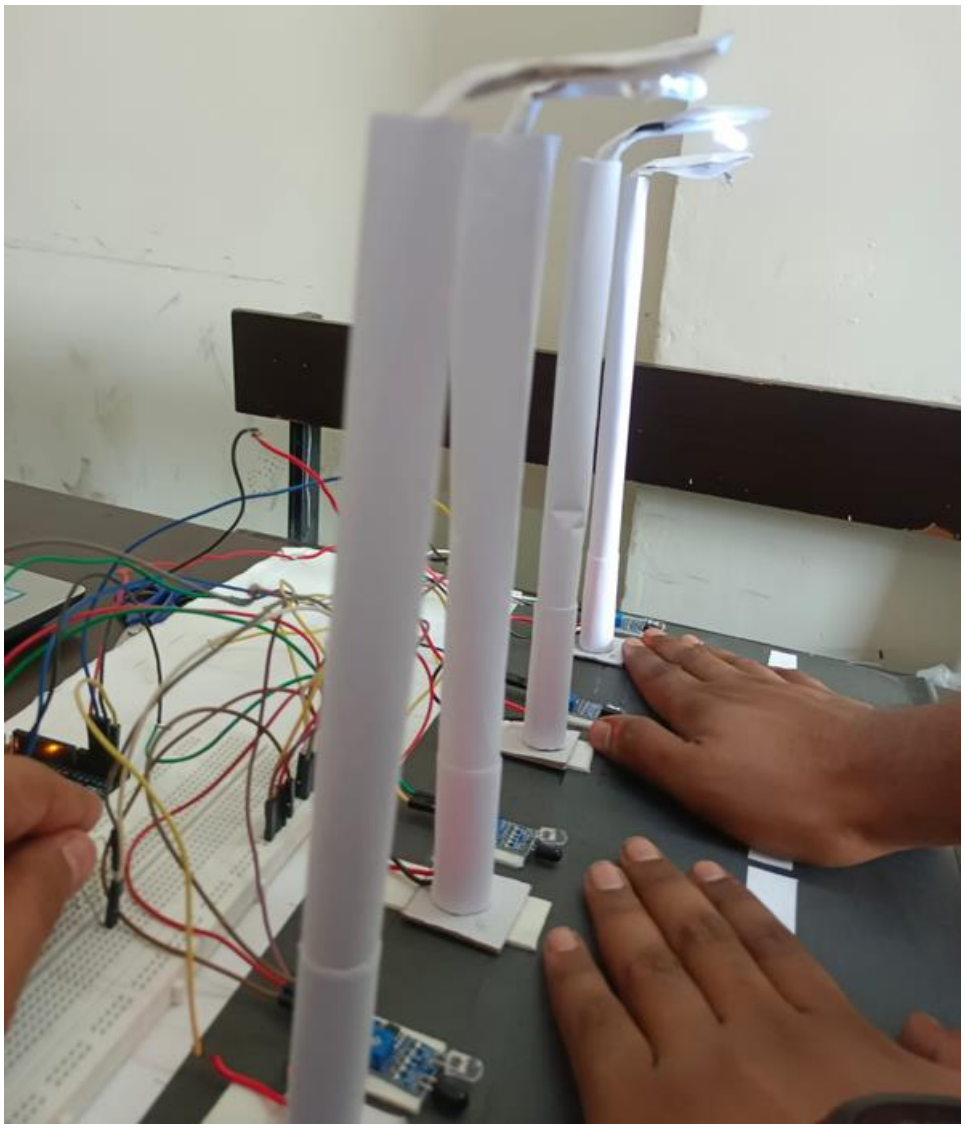
```
{

 digitalWrite(led, HIGH);
 analogWrite(led,255/5);

 digitalWrite(led1, HIGH);
 analogWrite(led1,255/5);

 digitalWrite(led2, HIGH);
 analogWrite(led2,255/5);

 digitalWrite(led3, HIGH);
 analogWrite(led3,255/5);


  if (analogRead(A0)<300)       // IR 1 CODE
        {
         digitalWrite(led,HIGH);
         analogWrite(led,255);
         delay(1000);// micro second
        }
      else
         {
           digitalWrite(led,HIGH);
           analogWrite(led,255/5);

         }

 if (analogRead(A1)<300)       // IR 1 CODE
        {
         digitalWrite(led1,HIGH);
         analogWrite(led1,255);
         delay(1000);// micro second
        }
      else
         {
           digitalWrite(led1,HIGH);
           analogWrite(led1,255/5);

         }
```

```
    if (analogRead(A2)<300)          // IR 2 CODE
        {
        digitalWrite(led2,HIGH);
        analogWrite(led2,255);
        delay(1000);// micro second
        }
      else
        {
          digitalWrite(led2,HIGH);
           analogWrite(led2,255/5);

        }

     if (analogRead(A3)<300)          // IR 2 CODE
        {
        digitalWrite(led3,HIGH);
        analogWrite(led3,255);
        delay(1000);// micro second
        }
      else
        {
          digitalWrite(led3,HIGH);
           analogWrite(led3,255/5);

        }

     if (analogRead(A4)<300)          // IR 2 CODE
        {
        digitalWrite(led4,HIGH);
        analogWrite(led4,255);
        delay(1000);// micro second
        }
      else
        {
          digitalWrite(led4,HIGH);
           analogWrite(led4,255/5);

        }
}

else
  {
```

```
        digitalWrite(led1, LOW);
        digitalWrite(led2, LOW);
        digitalWrite(led3, LOW);
        digitalWrite(led4, LOW);

    }

}
```

3.2 RESULTS





CHAPTER 4

CONCLUSION AND FUTURE SCOPE

4.1 Future Scope

Smart street lights are becoming popular world wide to reduce energy usage and enhancing safety and security. In the future, they may provide services such as WIFI and air quality monitoring.

Lights can be used to create “smart streets”, where sensors and other systems moniters and control traffic and pedestrian flow, improving visibility and public safety, creating a smarter, more efficient city.

4.2 Conclusion

Smart Street Lights are a revolutionary technology that can offer a wide range of benefits. From improved energy efficiency to improved safety, the advantages of this technology are undeniable.

Smart street lights can help to create a smarter, more efficient city environment, and are likely to become increasingly popular in the years to come. Smart street lights are a promising technology that can provide many benefits to our cities.

In conclusion, the implementation of a smart street light system using sensors presents a promising solution to the challenges associated with inefficient and outdated street lighting systems in cities. By leveraging sensor technologies and advanced data analysis, the smart street light system has the potential to significantly reduce energy consumption, lower carbon emissions, enhance safety in poorly lit areas, and optimize resource utilization.

However, addressing challenges such as sensor selection, integration, communication, algorithm development, privacy, security, and transitioning to a smart street lighting system will require careful planning, coordination, and innovative solutions. With the right approach, a smart street light system can contribute to creating sustainable and intelligent cities of the future, benefiting both the environment and the well-being of the communities. Further research, development, and implementation of smart street light systems are warranted to realize their full potential in transforming urban lighting infrastructure for a brighter and greener future.

CHAPTER 5

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IOT based smart street light management system | IEEE Conference Publication | IEEE Xplore