

A circular wreath of various botanical illustrations, including green ferns, red and orange flowers, and green leaves, framing a central white circle.

NMJ 32404 - Embedded System Design Mini Project

Automatic Street Light Controller

ESWARAN SHEDU (201021167)



Agenda

Introduction

Objectives

Block Diagram & Flowchart

Circuit Diagram

Calculation & Measurement

Result & Discussion

Conclusion

References



Introduction

An automatic street lighting system using 8051 microcontroller is a system that automatically controls the streetlights based on the presence of vehicles and pedestrians.

Based on the information received from the sensors, the microcontroller determines whether to turn on or off the streetlights. For example, if there are no vehicles or pedestrians in the vicinity of the sensors, the microcontroller will reduce the light to 25 % of the streetlights to conserve energy. Conversely, if the sensors detect the presence of vehicles or pedestrians, the microcontroller will increase to 75 % to make it 100 % of the streetlights to ensure their safety. Overall, this system can be very useful in reducing energy consumption and improving the safety of pedestrians and drivers on the road.





Objectives



Objectives

- ❑ **Energy Conservation** : Using 8051 microcontroller is to improve the functionality and efficiency of a conventional street lighting system. By adding additional sensors, such as the Infrared Sensor (IR) and Light Dependent Resistor Sensor (LDRs), the system can detect and respond to changes in the environmental conditions more intelligently. This allows the system to adjust the brightness of the streetlights based on the ambient light level and the distance of approaching objects, resulting in energy savings and increased safety for pedestrians and drivers.
- ❑ **Cost Reduction** : An Automatic Street Light Controller helps in reducing the cost of electricity bills by automatically controlling the streetlights, which reduces the unnecessary use of electricity during the daytime.
- ❑ **Safety & Security** : This can be achieved by integrating features such as adaptive lighting, which automatically adjusts the brightness of the lights based on the presence of pedestrians or vehicles. It should also have a backup mechanism in case of power outages or technical failures to minimize any potential risks. By enhancing visibility and ensuring a well-lit environment, the system contributes to the safety and security of residents, pedestrians, and drivers.

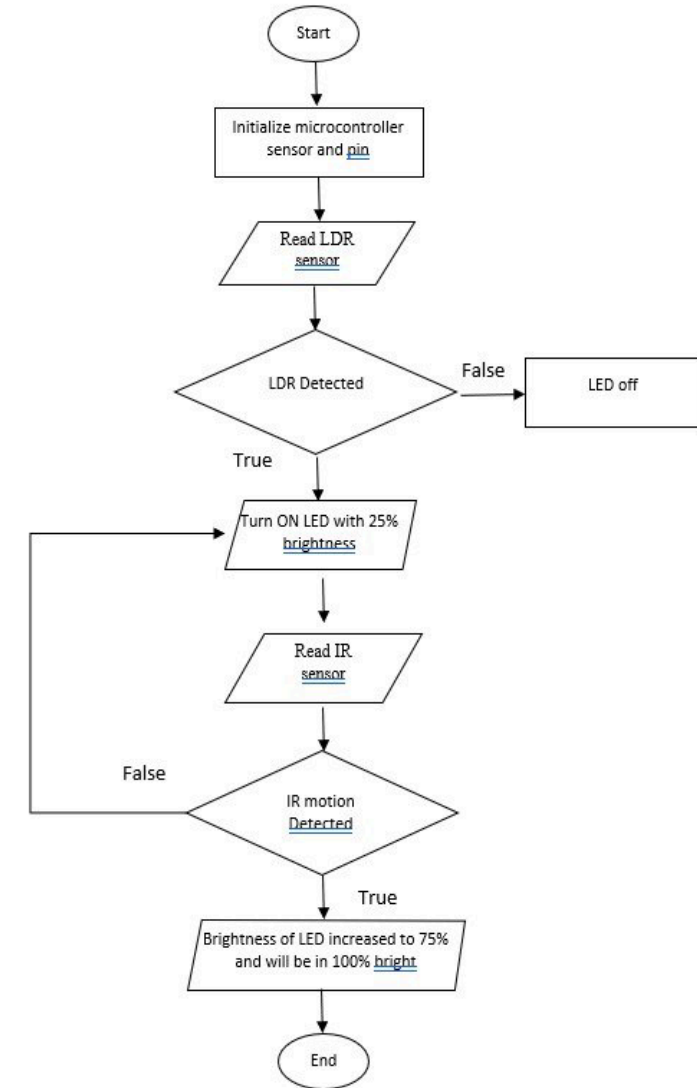
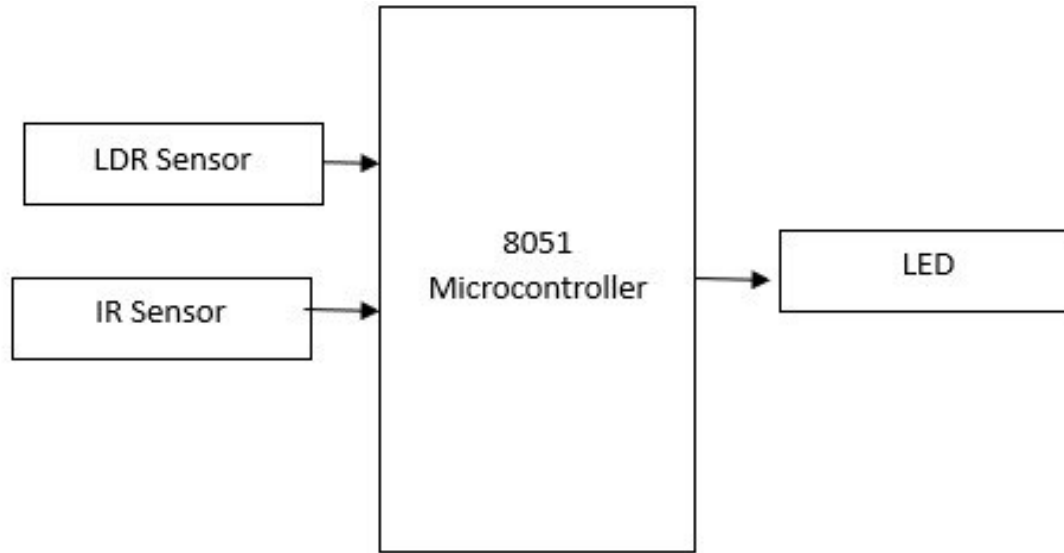




Block Diagram & Flowchart



Block Diagram & Flowchart

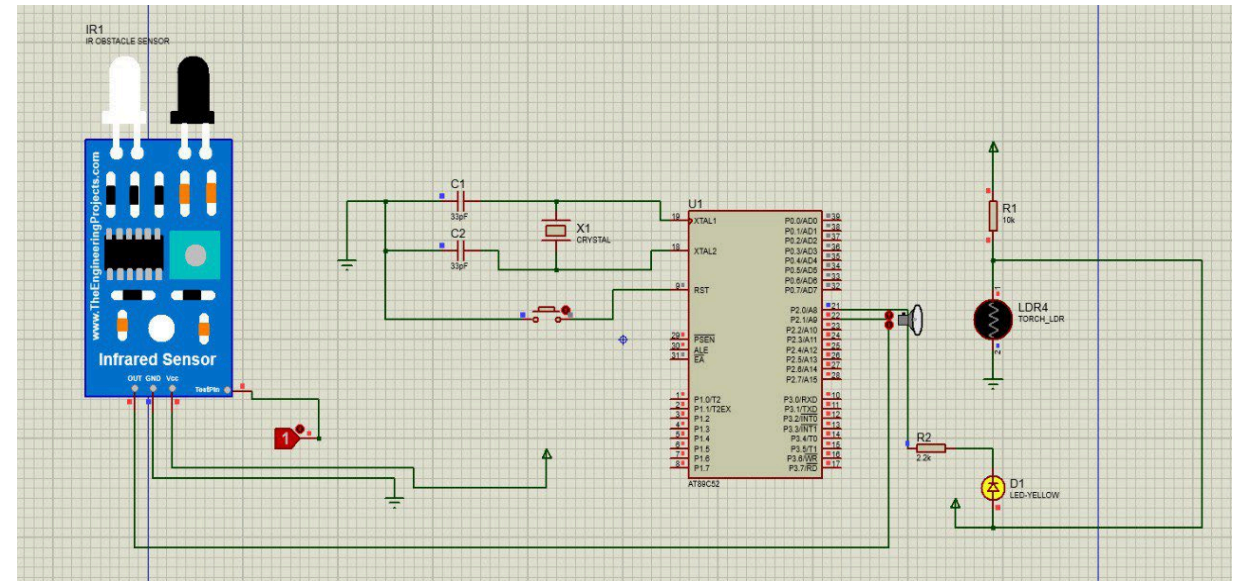
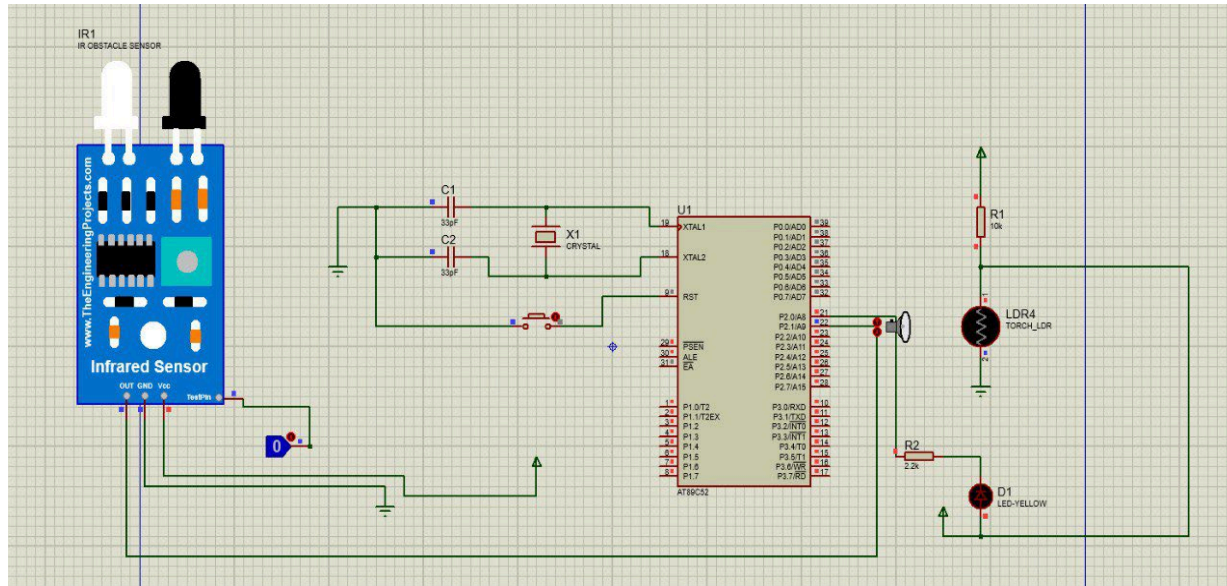




Circuit Diagram



Circuit Diagram





Result & Discussion

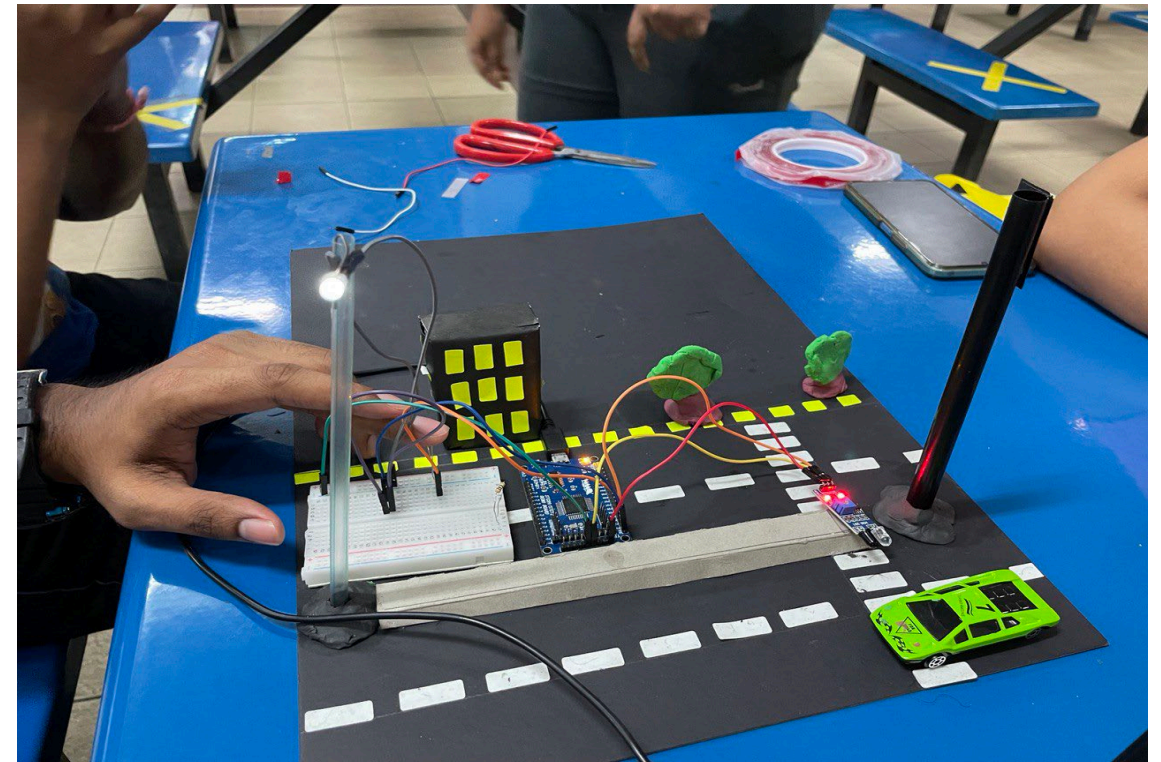
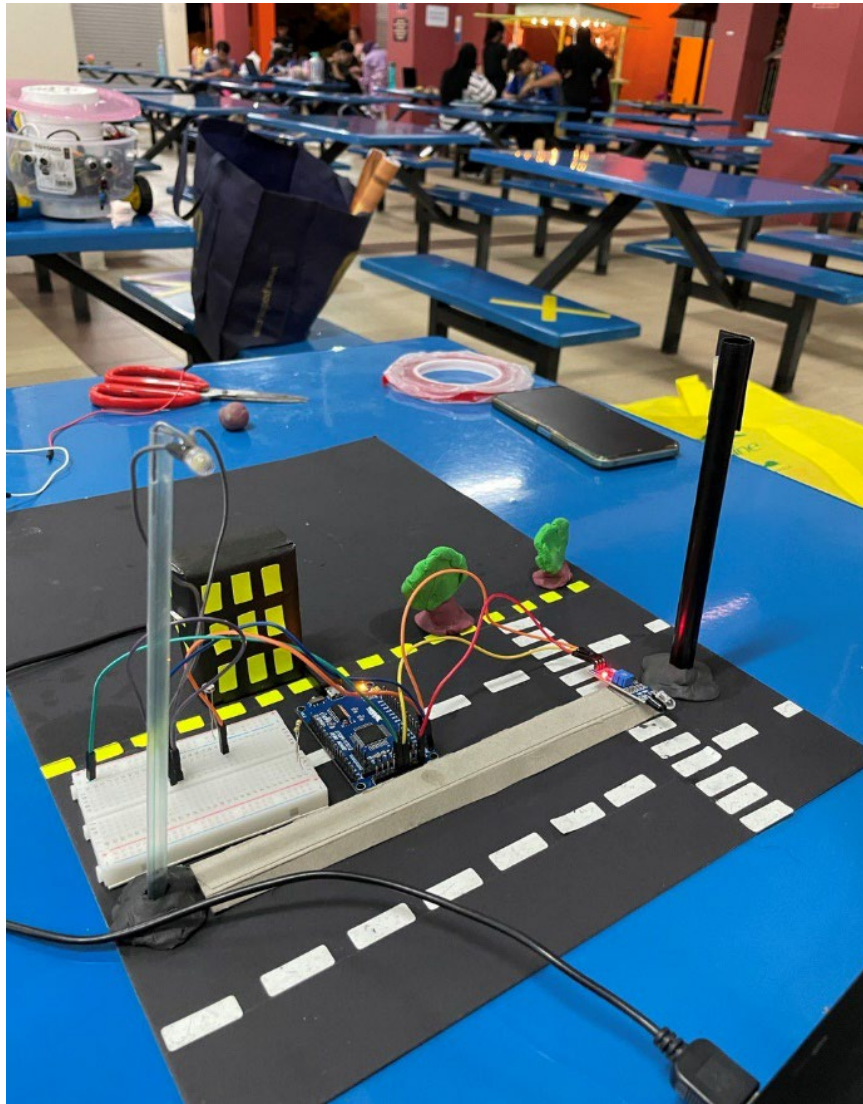




Result & Discussion

- ❑ The Automatic Street Light Controller System successfully incorporated several components, including STC89 microcontroller, Infrared Sensor (IR), Light Dependent Resistor (LDR) and LED.
- ❑ During daytime, the LDR sensor is off, so there is no any motion detected, therefore LEDs remain off and there is no any lights.
- ❑ During nighttime, the LDR sensor is on, the LEDs will blink and if there is any motion detected at IR sensor, the LEDs will turn on for 10 seconds and it will blink again until the next motion is detected.





Conclusion

The automatic street light controller project aims to address the inefficient use of energy in conventional street lighting systems by providing a more intelligent and efficient solution. It incorporates additional sensors such as LDR and Infrared Sensors (IR), resulting in energy savings and increased safety for pedestrians and drivers. The project is significant because it addresses a pressing issue of energy waste and provides an efficient solution that can be implemented in various outdoor lighting applications.





References

<https://microcontrollerslab.com/automatic-control-of-street-lights/>





Thank you

