Iot Based Smart Lighting Intelligent and Weather Adaptive Lighting in Street Lights

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Abstract - This project will be used to transform lighting from a simple illumination source into a smart infrastructure of the project. IOT will help in connecting the internet with the physical entity(lighting system).Helps in sensing the environment and providing the lighting accordingly leading to efficient use of electricity and saving energy.

The project helps in controlling the street lights wirelessly in a centralized manner. The lights can be switched ON and OFF anytime anywhere. Also, the intensity of the light can also be controlled according to the level of darkness in the surrounding environment

1. Problem Statement

This project's target is to optimize the street lighting system. The electricity used for the street lights is placed at anywhere between twenty to forty percent of that produced in India. An IoT based solution will keep control of which lights are working, and how much intensity will work the best in a particular scenario

2. Methodology

This project aims at designing smart street lighting system for energy saving of street lights. It controls the street lights based on detection of vehicles or any other obstacles on the street. We can control the lights wirelessly and also vary its intensity depending on the darkness level. Whenever the obstacle is detected on the street within the specified time the light will get automatically ON/OFF according to the obstacle detection.

3. Components Used

IR sensors - Basic working of an Infrared sensor used for obstacle detection is to transmit an IR signal, this infrared signal is reflected back from the surface of the obstacle and the signal is received at the IR sensor.

Light dependant resistor - The resistance of an ldr decreases in the absence of light and increases in the presence of it. Basically, an ldr makes the light connected to it glow automatically in the absence of light and turns it off when light comes.

Arduino - It is open source software which can be used for projects requiring to control or program objects. It is basically used for electronics based projects. It consists of two parts, the circuit board, used for making connections (hardware part) and the arduino IDE the software part of the arduino in which the programming is done.

555 integrated circuit - It is an extremely versatile timer that can be used in many different applications. This IC is a monolithic timing circuit that is a highly stable controller capable of producing accurate time delays or oscillations. Additional terminals are provided for triggering or resetting if desired.

Voltage regulator - One will get a continuing high-voltage power supplyemployingaffordable 3-terminal voltage regulators through some straightforward techniques represented below. Relying upon thisdemand, an affordable load regulation will be achieved. Some benefits of the regulator are given below: simplicity, low cost, and muchaffordable regulation characteristics.

4. Block Diagram

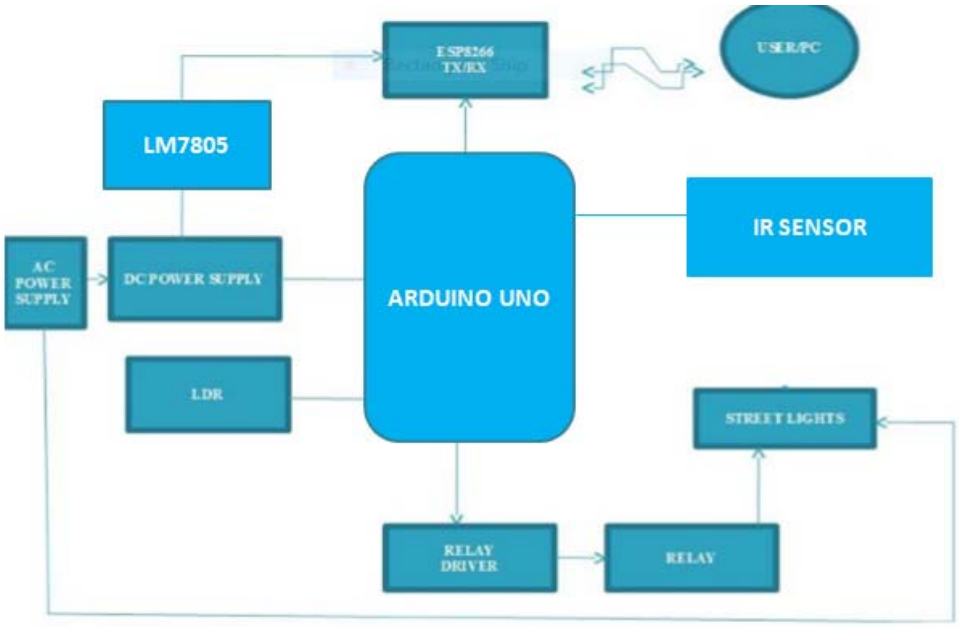

Figure 1. Block diagram of the system

Working

We send the command for switching ON or OFF of the lights through our phone or the laptop. This command is received by the arduino through the Wi-Fi module, which then controls the light according to the command.

In case an OFF command has been given the light will be switched ON in case an obstacle (like a car) passes by.

Project Images

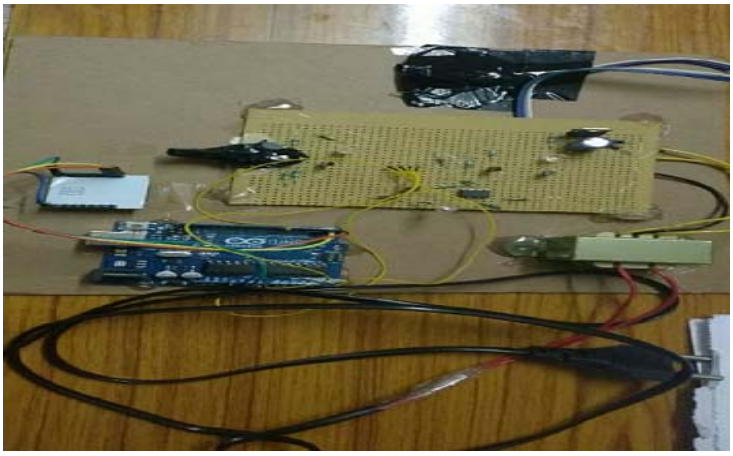

Figure 2. Project before Casing

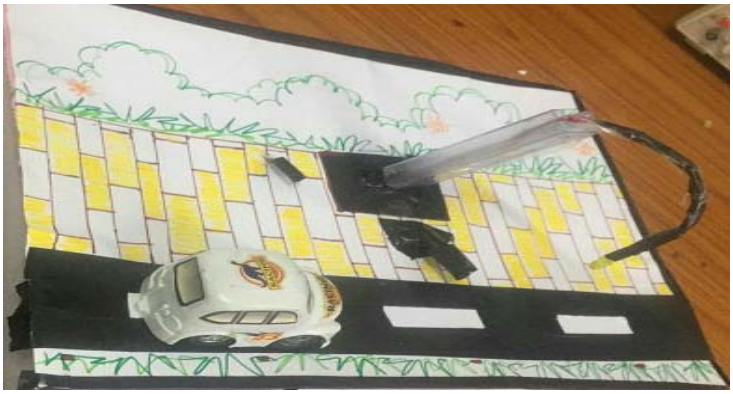

Figure 3. Project after Casing

Conclusion and Future Work

This project “IoT based smart lighting intelligent and weather adaptive lighting in street lights” could be a price effective, eco-friendly and therefore the safest technique to save energy and through this method the light status data is accessed from anytime and anyplace. It clearly tackles the matter the planet is facing these days that’s, saving energy.

The project has scope in variedalternative applications like for providing lighting in industries, campuses and parking lots oflargespaces like malls. The project presents much morebenefitswhich might over shadow the current limitations. Keeping in sight the long runadvantagesand therefore the initial price would never be an issuebecause the investment recurrence time is extremely less.

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