Vehicle Movement Street Light Controller System

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VEHICLE MOVEMENT STREET LIGHT CONTROLLER SYSTEM

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Abstract—the main purpose of Vehicle Movement Based Street Lights with External Light Sensing Using a Simple IOT concept by tracking the vehicle movement in order to save energy by switching the lights of the street light only when the system detects movement of vehicle. The system will on the street light ahead of the vehicle and switches off the trailing lights simultaneously, if a vehicle stops in between for longer time a buzzer beeps in order to indicate the move the vehicle immediately to save energy

Keywords—Simultaneously, Buzzer.

1) INTRODUCTION

The main purpose of Vehicle Movement Based Street Lights with External Light Sensing Using a Simple IOT concept by tracking the vehicle movement in order to save energy by switching the lights of the street light only when the system detects movement of vehicle. (1)The system will on the street light ahead of the vehicle and switches off the trailing lights simultaneously,(2) if a vehicle stops in between for longer time a buzzer beeps in order to indicate the move the vehicle immediately to save energy.

2) Existing System

A. Discussing about the current system

In the existing system, a lot of electricity gets wasted and we can see in municipality a lot of light cost a very high bill. The drivers in the night may not get clear vision in dim lights which cause accidents in urban areas, light pollution can hide the stars and interfere with astronomy and the migration of many bird species.

B. Finding out the problem in the Existing system

According to Environment and Energy Study Institute (EESI) a famous non-profit organization that promotes environmental sustainable societies, more energy consumption, as of 2019, globally 70% of all electricity was generated by burning fossil fuel, a source of air pollution and greenhouse gases, here globally there are approximately 300 million street lights using that electricity. Some of the other problems include

- Street lights must be switch on/off manually, the requirement of man power is more and also checking and maintenance should be done continuously.

- Due to the chemical called sodium vapor lamps, more energy is consumed, it is expensive as the light is ON the complete night

C. Disadvantages of Existing System
- More Energy Consumption.
- High expense.
- More manpower required for Manual switching off/on of Street Lights

III. .Proposed system

We are implementing a unique idea to overcome the scare city of electric city in India, by this technologies we are more confident enough to overcome this problem,By vehicle movement smart light system we are planning to implemented the smart street concept in which the system works by tracking the vehicle movement, there may be a question. "What if a person using a foot path instead of vehicle"? As we found in existing system there was no minimal light for a person's who uses foot path to overcome this problem we are introducing a light sensor to be working with minimal light, and this will get turned off automatically during the day time.

A. Reason for proposing this System

We have found that many drivers use their cell phone and keep wasting their time as well as electricity by talking in the same place for more than hour's by parking there vehicle, to overcome this problem we have introduced an buzzer in this project where if the vehicle is standing for more required number of time a buzzer sense it and automatically starts beeping until and unless the car is moved from the current location

B. To find a solution to save power in current street light system

- Use We have also introduced manual shutdown concept in order to have a the equipment leave longer without any arm during the bad weather conditions, during this the normal mode is activated and the street lights will be turned on as regularly, since it is a smart street we have retracted the entry for all vehicles to overcome the security issues we have introduced the security check system at the entrance, only the registered vehicles are allowed inside the smart city through the smart street.

- When it comes to the industrial concept project we have introduced the same concept in manufacturing industries.
    - Manual Switching off/on of Street Lights
    - More Energy Consumption.
    - High expense.
    - More manpower.

C. Advantage of Proposed System
- Automatic Switching of Street lights.
- Maintenance Cost Reduction.
- Reduction in CO_2 emission.
- Reduction of high pollution.
- Wireless Communication.
- Energy Saving.

IV. OBJECTIVES GOALS

By use of this system, we will try to control streetlights from the remote servers. The primary objective is to develop efficient Smart Street Light Systems.
- To provide wireless access for handling it.
- Need some Servers which can be used to monitor whole city's street lights.
- Internet technology with low cost can be used for remote access.

A. Figures and Tables

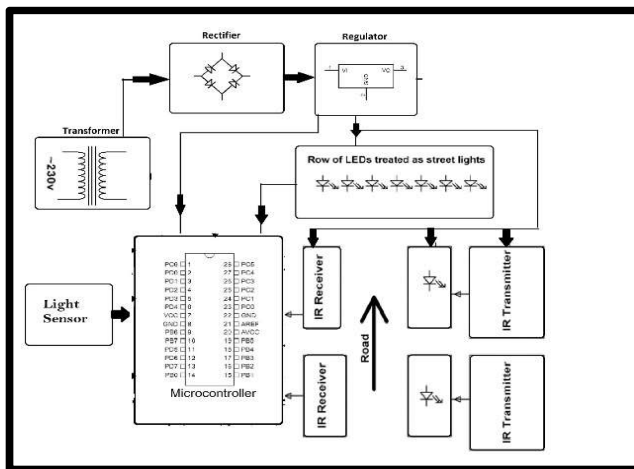#### 1) Methodology of problem solving:

Figure 1: Circuit connection diagram.

When a vehicle passes during day time the light sensor does not work because it is not necessary but when a vehicle passes at night then only light sensor work and glow. The sensors get activated only when there is a motion nearby during night but when there is no motion of anything the light remains dim, if any motion found the sensor will detect and light intensity becomes high automatically the above mentioned ideas can be implemented to any forms of devices in which light sensors are compatible with. The main purpose of Vehicle Movement Based Street Lights with External Light Sensing Using project is that it saves energy by putting on the lights of the system only when the system detects movement of vehicle. The street lights are operated here in automatic mode, if any human or vehicle movement detected through the sensors, the motion sensor triggers the microcontroller to turn the LEDs to their full brightness and it gets restored back to the dimming brightness with the help of the rectifier and regulator

Here in this diagram a transformer is an electrical device that transfers electrical energy from one electrical circuit to another circuit. A rectifier is an electrical device which converts an AC into a DC by allowing the current to flow through it in one direction only. The rectifie**r** is a device that converts the AC power from the alternator into DC power so that it can charge the battery. The regulato**r** ensures that the voltage is delivered within certain limits, hence preventing it from damage of battery. **IR** Transmitter and Receiver are used to control all the devices wirelessly. The light sensor is a passive devices that convert the light energy in the environment whether visible or in the infra-red parts of the spectrum into an electrical signal output. Light sensors are also known as "Photoelectric Devices" or "Photo Sensors" because they convert light energy into electricity that is photons to electrons. Microcontrollers are used here which is usually used in automatically controlled products and devices, such as automobile engine, power tools and embedded systems. Microcontroller ATMEGA is used here which commonly used in many projects and autonomous systems where a simple, low-powered, low-cost micro-controller is needed.

2) Flow Chart

Here in the below flow chart we are disccsing the detailed explation of a flow diagram of vehicle movent street light controller system
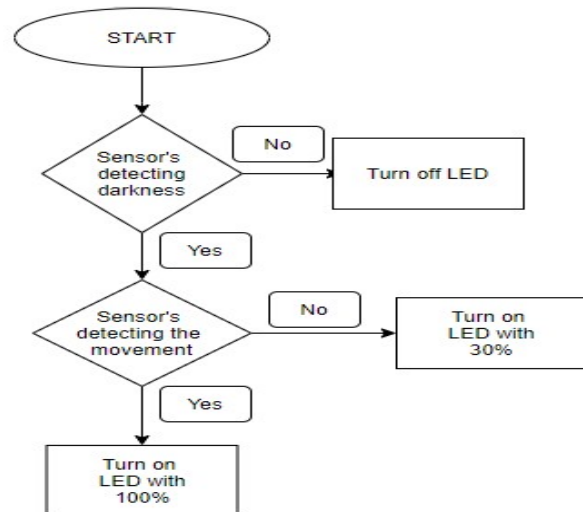

Figure 2: Flow chart

As mention mention the above Figure 2 we are discussing the complete reprecentation of our project once the system is started it detects for dark light if not found then Led is not invoked. If the sensor detectes the dark in night and if its detect the vechile movemt then the LED is invoked at 100% and if it is not detucted the LED is invoked only 30% of the actual ratio thus the street lights are turned on and off and the process continous with accuarte results.

3) Architectural Design

The system consists of a Security check which has a complete hold on the working of this system. By this even the weather related issues can also be sorted by measuring the weather forecast which is displayed by the software by checking in the security check point room
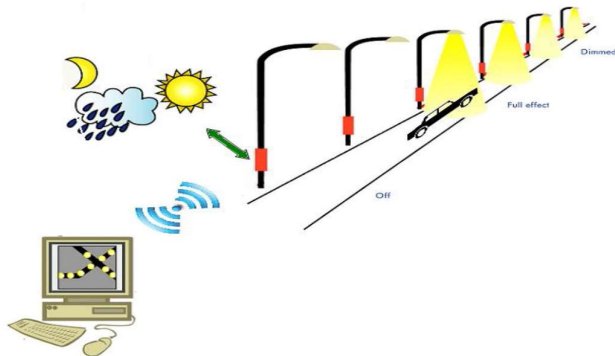

Figure 3: Street light system with weather recognizer.

The system is also designed in terms of modular system, in which it can be easily extendable. By measuring the usage of the system on a street and can be implemented at any time by expanding the given connection and with low cost at any flexible time.

After this process the streets are made to observe the condition of the intensity of both formatted LED lights depending on the usage of the streets. Also the newly expanded unit can be turned off if it's not required, Streets are took at most care during the daylight and depending the weather forecasted report the system are made to active or shut it down, and manually the normal mode is been activated.

We are pleased to inform you regarding our Other factors which are successfully influencing the activation are: weather forecast used to detect the climatic conditions, can be altered based on the requirement of the particular seasons, Light sensors, Buzzer installation with beep speakers, tracking the electricity usage and vehicle movement at the entrance of the security check, and we have designed this project in very unique format where keeping many possible Alternative factors which can be implanted in feature this project can be altered accordingly with less budget and the most unique reason is every lamp in this system are designed as an independent component to decide the activation of light

4) Hardware Design

Our project is a major topic which is depended on The hardware model, basically this model consists of LED light's where the intensity of lights are controlled.We have introduced infrared diodes which are commonly used to detect the vehicle movement's and sense it and accordingly the sensor works to manage the working of LED lights automatically.We are also introducing the variable resistors and Transistors which basically work as switch, and by implementing it it's quit cost effective
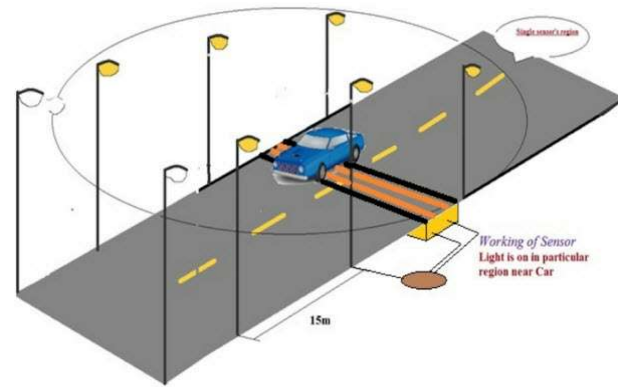

Figure 4: shows the function, when the vehicle passing is in the road. The streetlights are switched ON when the vehicles Working of sensors and activating the LED lights

We have designed the model in such a way that the infrared sensors are made to be placed near the street light and exactly opposite to this we have introduced light sensor's to control the intensity of lights.

As we discussed in proposed system we need to focus on both the street users who utilizes this road facilities by human beings and vehicles, and the rest is taken care by the system on altering the intensity of lights and manage the problem in short term period.

We have also proposed the unique way of Turn on / Turn off of the street which can be controlled manually from the security check and it has been design in such a way that it is quit flexible when it comes to the requirement of users

CONCLUSION

Finally we conclude that by taking a one step forward we are introducing the E-street concept which reduce the wastage of electricity in street light and also wastage of electricity in many industries through street light, Since we have used the light sensor if there is no vehicle movement the e found the dimming lights for foot path users this save energy by preventing more wastage of power compared in other existing system., since we also introduced the manual shutdown option this system will be shut down if it's not in use and this may be upgraded in feature also. Thus this system is more versatile and flexible to user requirement

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