IOT BASED SMART STREET LIGHT

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ABSTRACT

Automation has created a bigger hype in the electronics. The major reason for this hype is automation provides greater advantages like accuracy, energy conversation, reliability and more over the automated systems do not require any human attention. Any one of the requirements stated above demands for the design of an automated device. Energy can be effectively conserved if we can control the traffic lights on the highways by glowing them only when there is traffic on the road, and this is all most impossible to detect the arrival of a vehicle manually without the presence of light. So in this situation we should think about a system which is capable of sensing the arrival of vehicle and ON the lights and turn OFF as soon as the vehicle leaves the area and count the vehicle in total day. The total count of the vehicles will update into IOT based thing speak server database system.

Our high-power LED based streetlight controlling system is the result of this idea. This was designed with a vehicle detecting sensor which can sense the arrival of a vehicle. It drives the same information to a micro controller using internet of things we update everything into government websites immediately for status. The micro controller is interfaced with the streetlights and the total count of the vehicles will update into IOT. It is the responsibility of the controller to switch the status of the lights with respect to the acknowledgement received to it from the vehicle sensor and post into IOT. The major advantage of the device is it not only controls the intensity of the light as well as power saving on highways.

This Project work consists of a group of measuring stations in the street (one station located in each lamppost) and a base station located nearby. The measuring stations are used to observe street conditions as the intensity of daylight and, depending on the conditions they activate or off the lamps. For these reasons every lamp is designed independent to decide about the activation of light. The base station conjointly checks if any lamp is correctly operating and sends the information using the wireless network IOT.

Keywords: Smart streetlights, IoT, Automation.

1. INTRODUCTION

The main objective of the intelligent city is to improve the protection, convenience and convenience of operations and to conserve resources. To foster intelligent cities, an urban infrastructure is also more intelligent. As an integral part of the city's urban infrastructure, the street lamp is closely related to protection and energy conservation. Today, without street lights it is difficult to imagine how the city looks like. But in such a situation, theft and robbery are likely to seriously increase. it is easy to predict. In addition, the existing street lamp management needs to be streamlined due to its high energy level on day-by-day usage. Today, the key drawbacks of the street lamps are manual administration or the light perception controls: 1) Long cycle of servicing. Both manual management and monitoring of light perception take manual patrols to control broken street lamps. The maintenance cycle is therefore too long and it can be much longer than a few months, particularly for

the suburban street lamps. However the risk increases only after the street light is disabled, so more accidents, robbery and theft may occur. 2) Hard management of fine grain. Manual management is clearly not intelligent enough and can be managed with difficulty in real time. In addition, one switch is used to control several street lamps at the same time in order to simplify manual management. The versatility is nearly restricted for light perception control. Real-time controls and remote controls are not included in the latest management systems. 3) High use of energy. There are only two states nowadays street lights, off and on. Furthermore, their brightness cannot be changed. Therefore, excess energy is consumed. The street lamps may often be dim in order to conserve energy. 4) Easy robbery. No efficient way to avoid street lamps from being steeled exists. There are a large number of street lamps, so all of them cannot be regulated at all times. stop robbing, street lamps have the ability to track themselves. A new generation of street lamps must boost their efficiency by incorporating the following features in order to optimize the above-mentioned drawbacks in developing smart cities: 1) Minimize service life. One of the most significant maintenance cycles is major smart city criteria. The maintenance cycle must therefore be minimized to the extent possible. A mechanism must be given to verify in real time broken lamps.

2. LITERATURE SURVEY

S. Kamoji et al. (2020). [1] The method implemented is standardized, with modules: LED module and PIR, LDR, Emission Detector and the camera. The framework is a modular design. In the lack of motion and if the ambient light is sufficient, the brightness of the lights is decreased. The machine driver assistance module recognises the expelled cars by recognising the number plate. The recognition number plate was carried out with RCNN and some techniques for the analysis of images. Pollution levels can be detected and registered by the pollution sensor around the street lamps. These data allow us to generate a city heat map of pollution and to identify areas that congested high frequency. A docking point for charging electric cars, which is a prepayment facility, is provided on a light pole. Y. Xue et al. (2020). [2] A smart dimming model based on the neural network is drawn up in this paper. The system will analyse road information submitted by the sensor layer, and output the dimming signal, enhancing the effectiveness of a flow control and a nerve network. The test results showed that the model is more environmentally friendly and compatible with naked eye in contrast to the conventional approach. H.Ibrahim et al. (2020). [3] The study explores efforts to focus on the idea of using load pressure from the transport route junction by means of mobile vehicles to peat lands and transform it into electric energy using a ramp coupled with piston-spring pressure control and Piezoelectric equipment. Junjian He et al. (2019). [4] This study analyses the Wireless Sensor Network(WSN) intelligent road lighting system and the useless decision-making process. this paper. The system captures metrics of the traffic conditions through WSN and implements versatile rules to smartly change the light on the road. The evidence shows that this paper's sophisticated street lamp management system can intelligently control and light street lights on-demand, dramatically reduce energy usage and increase street lamp support and storage quality. M. Durgun et al. (2019). [5] The suggested street lighting offers special lighting depending on the region of illumination. The bulb can be tracked for the amount of light, location and fault conditions. For different illumination situations, variable structure techniques have been suggested. The proposed device, because of its practicality and effectiveness, is expected to provide a revolutionary solution for current lighting problems. Sunhuang Chi et al. (2019). [6] This report contains and implements a highly tuned access control mechanism (includes high competitiveness, high availability and high scalability) for urban street lamp IoT.

3. PROPOSED SYSTEM

This proposed street light intensity control monitoring project we are going to measure the fog on road and street light auto intensity control system for that we use input modules LDR for detect light , LCD for display for everything. Relay controls the led brightness all are integrated to micro controller Arduino which is powered by power supply. A Street Light Management System (SLMS) focused on fog computing for smarter cities. DHT11 module which detects the temperature and fog intensity levels on the street road. This data will give to micro controller and displayed by LCD module. LDR sensor which detects the light. Depending on the light intensity the street lights automatically turn ON and OFF depending on the day and night modes.
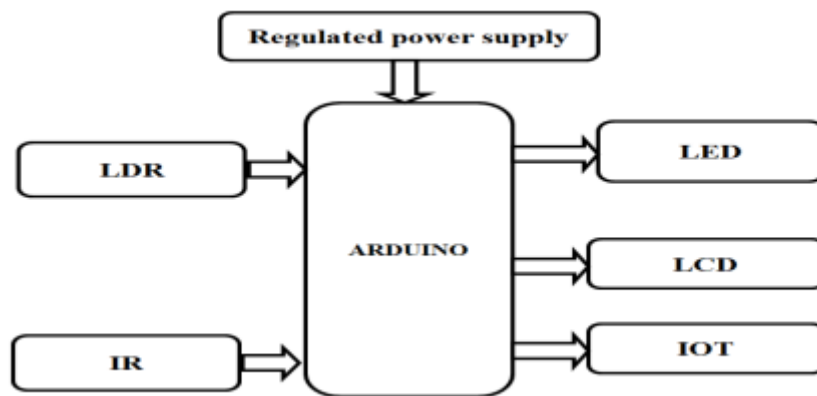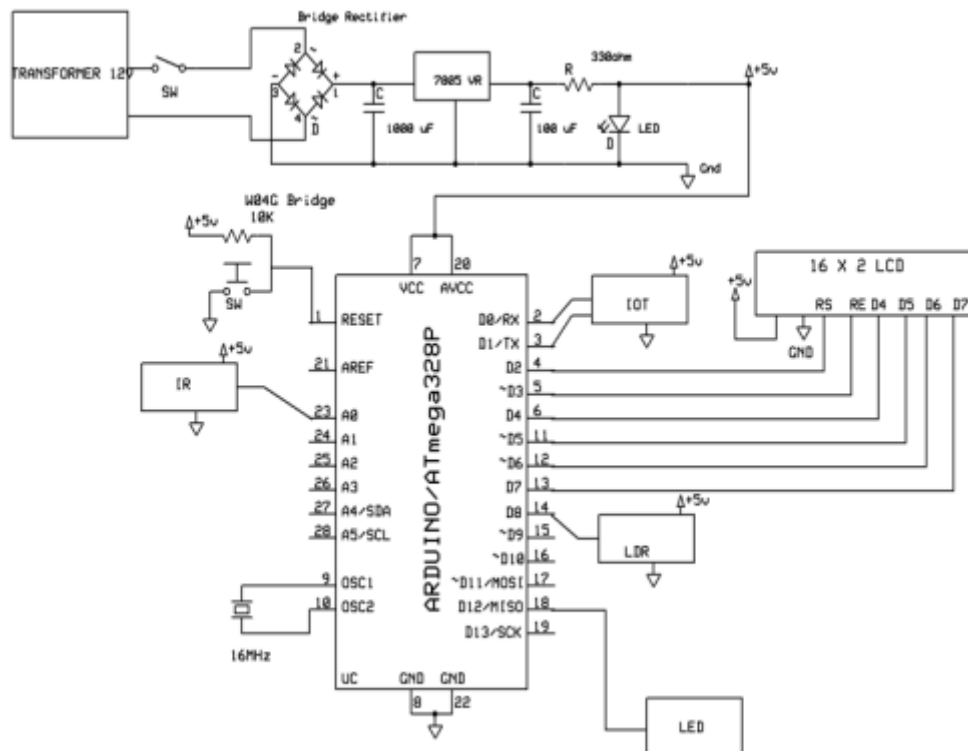

Fig. 1: Block diagram.

Fig. 2: Pin diagram.

4. RESULT
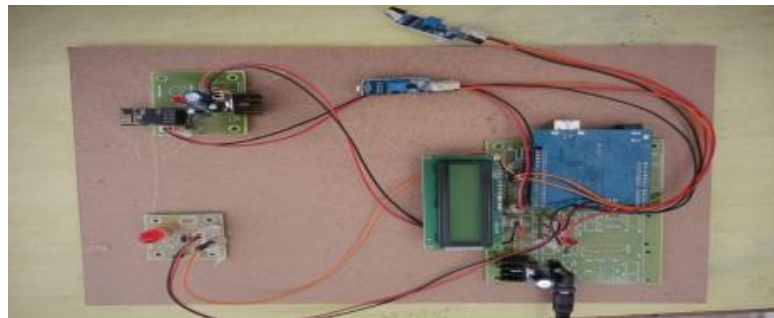
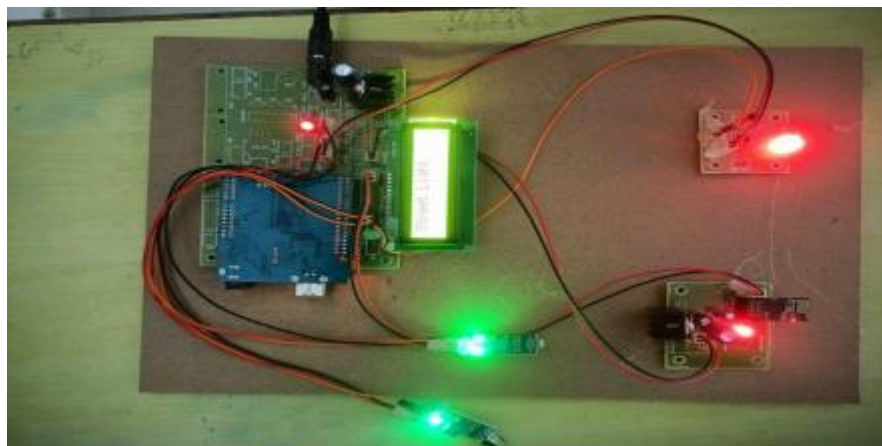**Working Module**

Fig. 3: Smart Street light kit.

Fig. 4: Smart Street light output.

5. CONCLUSION AND FUTURE SCOPE

We developed a management framework with a server focused on fog computing. This paper proposes a smart streets lamp (SLMS) based on fog computing to meet the requirements of smart cities. SLMS consists primarily of the following three parts: 1) intelligent sensor lamp (streetlamp brightness can be changed and autonomous alerts about lamp abnormality. Integrating features of all the hardware components used have been developed in it. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using highly advanced ICs with the help of growing technology, the project has been successfully implemented. Thus, the project has been successfully designed and tested. Our project "SMART STREET LIGHT" is mainly intended reduce the wastage of energy due to continuous ON of streetlights even though vehicle leaves the area.

Future Scope

This project can be extended using GSM. To measure vehicle, count as well as speed of the vehicles on street roads. GSM module will send the information regarding the vehicle speed and count, the status of streetlights to the respective authorities. India is one of the largest consumers of electricity from fossil fuel. The only way to reduce consumption is by using alternative source of electricity which aren't from fossil fuel. Streetlight because of its large wattage consumes, is a key consumer of fossil fuel electricity. Hence anything that reduces consumption of streetlights is great. Smart Street Light is the right way forward.

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