IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

HIGHWAY MONITORING SYSTEM AND POWER SAVING

B RAMAVARAPRASAD[1], SARIKA SAI KIRANMAYEE2, MONANGI VENKATESH3, MUKKAVILLI SOWRYA4, SARVASIDDHI VENUGOPAL5,

[1], Assistant Professor, 2,3,4,5, Students,

Department of Electrical and Electronics Engineering,

Lendi institute of engineering and technology, Vizianagaram, India

Abstract: The Task of monitoring of aging highway bridges and overpasses is important not only from the point of preventing economic losses but also is a matter of preventing catastrophic failures and loss of human life. In recent years wireless sensor technologies have been used extensively to develop highway monitoring platforms for bridges. A limitation of wireless sensors is the finite life span of batteries and high cost of battery replacements, which make such systems prohibitively expensive in many cases. The huge amount of electrical power of many countries is consumed in lightning the streets. However, vehicles pass with very low rate in specific periods of time and parts of the streets are not occupied by vehicles over time. In this paper, we propose a system that automatically reduces intensity of light for parts of the streets having no vehicles and increases the intensity of light for these parts once there are some vehicles that are going to come. Logically this system may save a large amount of the electrical power. In addition, it may increase the lifetime of the lamps and reduce the pollutions. This system automatically controls and monitors the light of the streets. It can light only the parts that have vehicles and help on the maintenance of the lightning equipments. We are also proposing a street light with image processing camera to monitor the situations near the highways, also lonely areas. If the street light is turned ON for more.

Keywords: LDR(LightDependentResistor),IRSensors,Ultrasonicsensors, Timing circuit, Aurdino(ATMEGA328P)

I. INTRODUCTION

As the 20th century comes to a close, the need to understand the number and type of vehicles' using our nation's roadways is becoming more and more important. Since the construction of paved roads, we have struggled with ways to record vehicular movement. Not only is this information required for proper design of roadways, but also new Intelligent Transportation Systems (ITS) require real- time knowledge of traffic movement to be effective.Road traffic is a complex phenomenon, where various entities (pedestrians, cars, trucks, busses, tramps, bicycles, etc.) interact one each other, when using common infrastructure. The traffic management and control, due to infrastructure constraints and rising number of vehicles, is a complex task and requires application of dedicated algorithms together with precise traffic data (both allow detecting and classifying the vehicles in selected areas by using data from sensors. A major drawback of the solutions integrated with infrastructure is a low flexibility and significant maintenance cost.

II. SENSOR TECHNOLOGY

The use of Automated vehicle identification sensors bears mention as a technology with potential for significant impact in the area of highway traffic monitoring. Systems of this type are heavily used for The information about number of vehicles and their types is helpful in reducing travel times and emissions . The precise traffic data can be provided by traffic monitoring systems that are usually integrated with road infrastructure. Such system drawbacks, applications of new technologies (e.g., wireless sensor networks) in traffic monitoring are considered .Such solutions can facilitate installation and reconfiguration of the system. However, the cost is still significant. toll applications, and a number of studies have been conducted to explore their application to general highway use. If the logistical problems of instrumenting every vehicle can be overcome, this technology would provide a means of determining the required weight information without repeated weighing of the vehicle, thus simplifying the recording equipments. without repeated weighing of the vehicle, thus simplifying the recording equipments.Of all the technological advancements of the 20th century, the development and broad application of the micro computer provided opportunities for recording, processing, and transfer of large quantities of data. The microcomputer is believed to have had the greatest impact on the monitoring of highway traffic

III DATA RECORDING AND TRANSFER

In the last two decades, the increases in mass data storage capability and data transfer speeds have been nothing short of phenomenal. These advancements have allowed for safer operations and have set the stage for necessary links to ITS applications. Cellular phone service has provided access to remote sites where direct line service is unavailable, providing for increased efficiency and safer data collection. New algorithms for data compression and increased data transfer speeds have helped to reduce data transfer times greatly reducing the costs of data transfer. Although it is still necessary to travel to some sites to collect recorded data storage capacity has allowed for less frequent visits, also reducing costs.

IV COMPONENTS

- LDR'S
- IN4007 DIODES
- TRANSFORMER
- CAPACITORS
- VOLTAGE REGULATOR
- WIFI MODULE.
- IR SENSOR

4.1 ATMEGA 328P

ATmega328 is an 8-bit and 28 Pins AVR Microcontroller, manufactured by Microchip, follows RISC Architecure and has flash type program memory of 32KB. It has an EEPROM memory of 1KB and its SRAM memory is of 2KB. It has 8 Pin for ADC operations, which all combines to form Port A (PA0 – PA7). It also has 3 built In Timers, two of them are 8 Bit timers while the third one is 16-Bit Timer. You must have heard of Arduino UNO, UNO is based on atmega328 Microcontroller. It's UNO's heart. It operates ranging from 3.3V to 5.5V but normally we use 5V as a standard. Its excellent features include the cost efficiency, low power dissipation, programming lock for security purposes, real timer counter with separate oscillator.It's normally used in Embedded Systems applications. You should have a look at these Real Life Examples of Embedded Systems, we can design all of them using this Microcontroller.

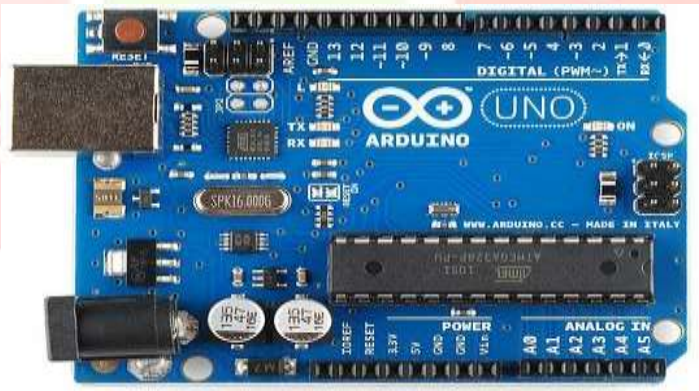
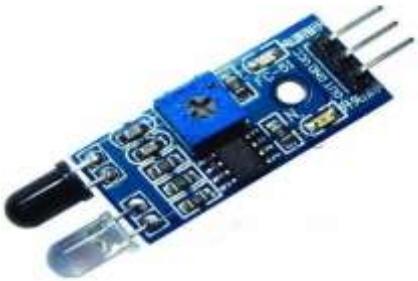


Fig.1 Atmega 328p

4.2 IR SENSOR

An infrared sensor is an electronic device, that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measure only infrared radiation, rather than emitting it that is called a passive IR sensor. Usually, in the infrared spectrum, all the objects radiate some form of thermal radiation. These types of light received radiations are invisible to our eyes, that can be detected by an infrared sensor. The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode that is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photodiode, the resistances and the output voltages will change in proportion to the magnitude of the IR

Fig.2 IR Sensor



4.3 7805 VOLTAGE REGULATOR

A regulated power supply is very much essential for several electronic devices due to the semiconductor material employed in them have a fixed rate of current as well as voltage. The device may get damaged if there is any deviation from the fixed rate.One of the important sources of DC Supply are Batteries. But using batteries in sensitive electronic circuits is not a good idea as batteries eventually drain out and loose their potential over time. Also, the voltage provided by batteries are typically 1.2V, 3.7V, 9V and 12V. This is good for circuits whose voltage requirements are in that range. But, most of the TTL IC's work on 5V logic and hence we need a mechanism to provide a consistent 5V Supply. Here comes the 7805 Voltage Regulator IC to the rescue. It is an IC in the 78XX family of linear voltage regulators that produce a regulated 5V as outpt

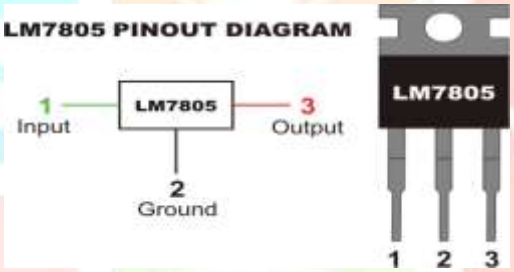


Fig.3 7805 Voltage Regulator

4.4 LIGHT DEPENDENT RESISTIR (LDR):

A Light dependent resistor (also known as a photo resistor or LDR) is a device whose resistivity is a function of the incident electromagnetic radiation. Hence, they are light-sensitive devices. They are also called as photoconductors, photoconductive cells or simply photo cells. They are made up of semiconductor materials that have high resistance. There are many different symbols used to indicate a photo resistor or LDR, one of the most commonly used symbol is shown in the figure below. The arrow indicates light falling on it.

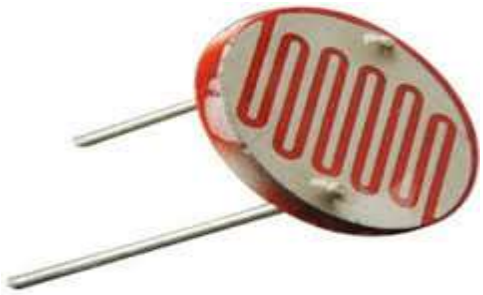
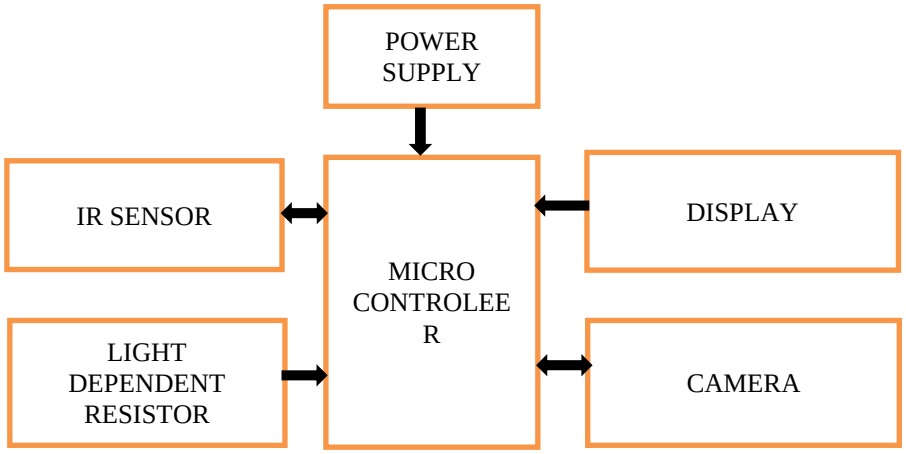


Fig.4 Light Dependent resistor

V BLOCK DIAGRAM



VI RESULT

The project is successfully implemented in many areas based on the experimental verification proving that it can save the electrical power and the system became the origin for upcoming advanced intelligent system in saving both human and electrica1 power.

Fig.5 Hardware Implementation

Intensity of the street light can be controlled and we can conserve power effective and also street light lamp efficient and life span increased.

VII CONCLUSION & FUTURE RESEARCH

What does the 21st century hold for traffic monitoring? It can be safely said that integration of monitoring efforts with the needs of ITS will be forthcoming, since the needs of both are complementary. Sensor technology will continue to advance, providing more accurate and reliable sensors. Combination of intrusive and nonintrusive sensors will be used to meet monitoring needs. With the impetus on lower cost and less impact to the roadway, sensors may be actually paved into the roadway during construction and remotely transmit vehicle parameters to a receiver. Application of advanced statistical methods is expected to yield better samples and more reliable summary statistics. Beyond these simple extensions of current technology, only creativity and innovation limit the possibilities. As we usher in the new millennium, the real challenge is to educate a new generation of professionals, arming them with the finest tools of our trade. From their minds and hands will come the exciting advancements that will meet challenges yet unforeseen. It deals with preliminary developing an accident detection in highways using an artificial sensing unit along with the power saving techniques based on density of vehicles. Large amount of power can be saved by using automatic street light systems and also we can save the lives of the victims who met with accidents that occurs on the highways by using webcams. From webcams, accidents and improper issues can be detected and alert to concerned departments like AMBULANCE service, POLICE service, and HIGHWAY PATROLING service. From there, further actions like monitoring and communicating the victims can be done. The system will focus on saving life and saving power.

VIII REFERRENCES:

[1]. Donald Sawicki. Traffic Radar Handbook: A Comprehensive Guide to Speed Measuring Systems, Authorhouse, 2002(1).

[2]. Abbass, A. (2010). Estimating vehicle speed using image processing(2). Al-Man sour Journal, 2010, vol. 14, no. 2, pp. 127 – 140.

[3]. Daniel Dailey, Li Li. Video (5)image processing to create a speed sensor, 2000 (report).

[4]. Singh, S., Chawla, R., & Singh, H. Intelligent(7) speed violation detection system. International Journal of Engineering and Technical Research, 2014, vol. 2, no. 1, p.92 – 95.

[5]. Sina,(3) I., Wibisono, A., Nurhadiyatna, A., Hardjono, B., Jatmiko, W., & Mursanto, P., Vehicle Counting and Speed Measurement Using Headlight Detection, In: International Conference on Advanced Computer Science and Information Systems (ICACSIS), Sep 2013, IEEE, Bali Indonesia, pp. 149 – 154.

[6]. Song, A., & Zhang, M. Genetic(4) programming for detecting target motions, Connection Science, 2012; vol 24, no. 2, pp. 117 – 141.

[7]. Lin, H. Y., Li, K. J., & Chang, C. H. Vehicle(6) speed detection from a single motion blurred image, Image and Vision Computing, 2008; vol. 26, no. 10, pp. 1327 – 1337.

[8]. Rad, A. G., Dehghani, A., & Karim, M. R. Vehicle speed detection in video(10) image sequences using CVS method. International Journal of Physical Sciences, 2010; vol. 5,no. 17, pp. 2555 – 2563.

[9]. Bailo, G., Bariani, M., Ijas, P., & Raggio, M. Background estimation with Gaussian distribution for image segmentation, a fast approach, In: proceedings of the IEEE International Workshop on Measurement(9) Systems for Homeland Security, Contraband Detection and Personal Safety Workshop, 29 – 30 March 20015, Orlando, USA.

[10]. Kumar, P., Singhal, A., Mehta, S., & Mittal, A. Realtime moving object detection algorithm on highresolution videos using GPUs. Journal of Real-Time(8) Image Processing, 2016, vol. 11, no. 1, pp. 93 – 109.