Indo American Journal of Multidisciplinary Research and Review (IAJMRR)
ISSN: 2581 - 6292 / Impact Factor: 6.885 / Website: www.iajmrr.com

IMPLEMENTATION OF SMART TRAFFIC MANAGEMENT SYSTEM

V. Anupriya
Assistant Professor, Sri Ramakrishna Engineering College, Coimbatore, Tamilnadu

Cite This Article: V. Anupriya, "Implementation of Smart Traffic Management System", Indo American Journal of Multidisciplinary Research and Review, Volume 5, Issue 1, Page Number 4-5, 2021.

Abstract:

The implementation of smart traffic management model which remedies some of the prevailing issues like fixed timing. So the proposed method will enable the traffic control to give the dynamic timing based on the density of the traffic. If the traffic is high in one particular way, the green light will automatically extend its timing. So the implementation of smart traffic management system also determines the traffic congestion and hence the red & green light time duration for the path can be dynamically changed and analyzed in lab view.

Key Words: Arduino Mega 2560 Microcontroller, Infrared (IR) Sensors & Lab View Software

Introduction:

The system consists of Infrared sensor and a microcontroller. The IR Sensors are used to detect the vehicle that crosses it and communicates the collected data to the micro controller. In a four way junction, each lane is provided with three sensors placed at a particular distance from each other. This will help to measure the density of traffic and adjust the green light intervals accordingly.

Literature Survey:

The paper [1] describes the things using Internet to control the traffic. In this the traffic signals are managed by monitoring the traffic density to avoid traffic congestion on road using network communication between server and hardware module.

The paper [2] presents the deployment of a smart phone- based measurement system for road vehicle traffic monitoring and usage based insurance. The measurement system provides two data streams namely a primary data stream to shore up road traffic monitoring and a secondary data stream to support the usage- based insurance program.

The paper [3] proposes the Lab VIEW Simulation model for controlling the traffic lights based on time interval. This Simulation model can be extended to control the time interval of the traffic light based on traffic density.

The paper [4] proposed that the dynamic time-based coordination schemes where the green signal time of the traffic lights is assigned based on the present conditions of traffic. This is achieved by using 3 pair of IR sensors (Transmitter and Receiver) across the road to monitor a particular length / zone while vehicles on the same zone block the IR light falling on the IR receiver to assume low traffic density.

Working Mechanism:

Existing Method:

Since the traffic light controlling system has been introduced, the primary method lead to the introduction of fixed timing, i.e. the signal lights have preset time intervals and works according to them irrespective of the traffic.

Proposed Model:

The Traditional method for traffic control uses a time controller. The existing traffic controlling method has limitations like fixed timing. Due to this there is wastage of time by a green light for same time on less congested road when compared to more congested road. To overcome the above disadvantages it is highly beneficial to design and implement smart traffic management system. This paper proposes a system where the time will be dynamically changed in both the peak and leisure hours by detecting the density of vehicles. Here the density of vehicles can be detected by counting the number of vehicles.

The implementation of smart traffic management system that works under dynamic timing in order to reduce the traffic congestion and reduce travelling time. In a lane, there are three sensors which are placed at distinguished positions i.e, one for low density, one for moderate density and one for high density of traffic. For example, at low density traffic, if the delay for green light is set for 30second then at low density the green light will go for 30second and then it automatically changes to red light. Likewise, if the delays are set to 45second and 60second for moderate and high densities of traffic then the green lights goes for 45second and 60second respectively.

By using dynamic timing for traffic control, we can overcome some of the disadvantages like unnecessary wastage of petrol and more time consumption.

Requirements:

Arduino Mega 2560 Microcontroller:

The Arduino Mega 2560 microcontroller board based on the Atmel AT Mega 2560. It has 54 digital input/output pins (of which 14 can be used as pulse width modulation (PWM) output, 16 analog inputs, 4

UARTs, 16MHz crystal oscillator, a USB connection, a power jack, an onboard 256 kilobytes of flash memory and a reset button.

Infrared (IR) Sensor:

Infrared Sensor module has built-in IR Transmitter and IR Receiver that sense out IR energy and looks for reflected IR energy to detect presence of any obstacle in front of the sensor module. The module has on board potentiometer that lets user adjust detection range (2cm-30cm).

Lab View Software:

Lab View (Laboratory Virtual Instrument Engineering Workbench) is systems engineering software for applications that require test, measurement and control with rapid access to hardware and data insights. It is commonly used for data acquisition, instrument control and industrial automation on a variety of platforms including Microsoft windows, various versions of UNIX, LINUX and Mac OS X.

Block Diagram:

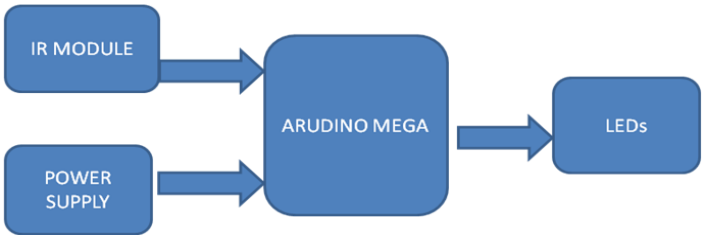

Figure:

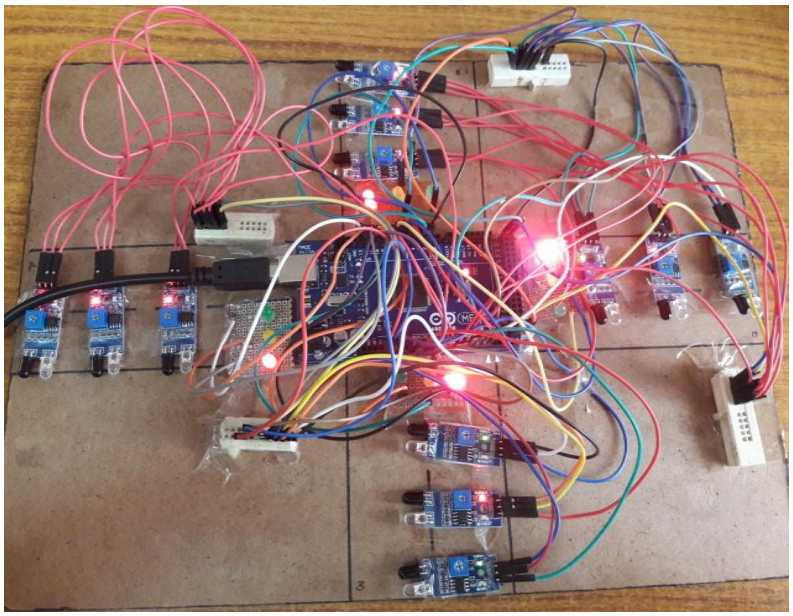

Figure: Smart Traffic Management System

Conclusion:

Thus the developed system provides very simple and efficient way to dynamically handle the traffic signal system at four way junction. The system is cost efficient and less complex. The system works efficiently even during peak and leisure hours. Thus the system demonstrates efficient functional and meets all the functional requirements. It will also help to reduce travelling time as well as fuel consumption and thus help to reduce pollution as well.

References:

1. Nikita Tendulkar , Komal Sonawane, Darshana Vakte, Deepti pujari, Ghanshyam Dhomase, “A Review of Traffic Management System Using Iot” published in April 2016
2. Handel. P, Skog. I**,** “Smart Phone – Based Measurement System for Road Vehicle Traffic Monitoring and Usage-Based Insurance”. Vol. 8, no. 4, pp. 1238-1248. IEEE, (2014)
3. N. Dinesh Kumar , G. Bharagava Sai, K. Shiva Kumar “Traffic Control System Using Labview” Global Journal of Advanced Engineering Technologies, 2013
4. Morarescu, Nancy Univ, France, “Highway Traffic Model Based Density Estimation” - IEEE paper published in American Control Conference (ACC), 2011