Project title

Density based traffic light control using IOT in Oman

Project description

As the automobiles are increasing day by day in Oman, controlling of traffic is becoming hectic. Existing system changes the signal according to time delay. Even there is no traffic on the other side one should wait for the signal. It brings down the productivity of individual and thereby the society as lots of work hour is wasted in the signals[1]. Therefore, in order to get rid of these problems or at least reduce them to significant level, newer schemes need to be implemented by bringing in sensor based automation technique in this field of traffic signaling system.

Under present scenario, traffic control is achieved by the use of a system of hand signs by traffic police personnel, traffic signals, and markings. A comparable and matching education program is needed, through driver-licensing authorities, to assure that those who operate motor vehicles understand the rules of the road and the actions that they are required or advised to take when a particular control device is present[4]. Each traffic control device is governed by standards of design and usage; for example, stop signs always have a red background and are octagonal in shape. Design standards allow the motorist to quickly and consistently perceive the sign in the visual field along the road. Standard use of colors and shape aids in this identification and in deciding on the appropriate course of action.

The system we propose identify the density of traffic on individual lanes and thereby regulate the timing of the signals' timing. IR transmitter receivers count the obstructions and provide an idea about the traffic density on a particular lane and feed this response to a controller unit which will make the necessary decisions as and when required.

The model works on the principle of changing delay of Traffic signals based on the number of cars passing through an assigned section of the road. There are four sensors placed at four sides of a four way road which counts the number of cars passing by the area covered by the sensors[1,2].

 The project is aimed at designing a density based dynamic traffic signal system where the timing of signal will change automatically on sensing the traffic density at any junction. Traffic congestion is a severe problem in most cities across Oman and therefore it is time to shift more manual mode or fixed timer mode to an automated system with decision making capabilities. Present day traffic signaling system is fixed time based which may render inefficient if one lane is operational than the others. To optimize this problem we have made a framework for an intelligent traffic control system. Sometimes higher traffic density at one side of the junction demands longer green time as compared to standard allotted time We, therefore propose here a mechanism in which the time period of green light and red light is assigned on the basis of the density of the traffic present at that time. This is achieved by using PIR(proximity Infrared sensors). Once the density

is calculated, the glowing time of green light is assigned by the help of the microcontroller (Arduino). The sensors which are present on sides of the road will detect the presence of the vehicles and sends the information to the microcontroller where it will decide how long a flank will be open or when to change over the signal lights. In subsequent sections, we have elaborated the procedure of this framework.

Project significance and objectives:

- To examine the disadvantages of existing traffic signal system at various locations in Oman.
- To provide a better improvement in traffic signals.
- To reduce the number of accidents in the traffic signal
- To select the optimal traffic signal cycle according the density of vehicles by using IR sensors

Methodology

- Creating a prototype model to demonstrate the density based traffic light control
- Software will developed based on the density of vehicles on a side
- Comparative study of merits and demerits of existing and proposed methods

Timeline (Provide a detailed timeline for completion of the project within one year)

S.NO	Content	Explanation	Period
1	Literature survey	Collection of data from the references using internet that will understand the conventional system	1 month
2	Filed study of existing system	Select 4 or 5 types of traffic signals and visit those signals once in week for a couple of months	2 months
3	Design of proposed system (proto type model)	Making the design of prototype density based traffic light controller	3 months
4	Study the merits and demerits	Comparative study of merits and demerits	1 month
5	Writing the program to control the traffic signal	Using kile software program is to be loaded in microcontroller	1 month
6	Testing	The completed work will be tested.	1 month
7	Document preparation	The completed work will be documented in standard format.	1 month

Bibliography

[1] Bilal Ghazal , Khaled ElKhatib , Khaled Chahine &Mohamad Kherfan "Smart traffic light control system 2016" Third International Conference on Electrical, Electronics, Computer Engineering and their Applications (EECEA)

[2] Er. Faruk Bin Poyen, Amit Kumar Bhakta et.el." International Journal of Advanced Engineering, Management and Science (IJAEMS) " [Vol-2, Issue-8, Aug- 2016] Infogain Publications

[3] Priority Based Traffic Lights Controller Using Wireless Sensor Networks by Shruthi K R and International Journal of Advanced Engineering, Management and Science (IJAEMS) [Vol-2, Issue-8, Aug- 2016] Infogain Publication

[4]. K.Vidhya, A.BazilaBanu "International Journal of Innovative Research in Science, Engineering and Technology "Volume 3, Issue 3, March 2014 Density Based Traffic Signal System.

[5] Dinesh Rotake and Prof.SwapniliKarmore "Intelligent Traffic Signal Control System Using Embedded System by, Innovative Systems Design And Engineering", ISSN 2222-1727 (paper) ISSN 2222-2871 (online), Vol. 3, No. 5, 2012.

Budget and Budget justification

S.NO	Budget category	Justification	Amount
1	Equipment	To make the hardware parts, IOT,microcontroller.	OMR 300
2	Travel	To observe the existing traffic signal for a couple of months.	OMR 150
3	Food and allowance	2 persons X 12 days X 2 time X 2 OMR	OMR 100
4	Literature collection	To browse and print the recent research journal papers	OMR 100
5	Documentation	To prepare final documentation	OMR 100
6	Miscellaneous		OMR 100
		TOTAL	OMR 850