INTELLIGENT TRAFFIC LIGHT TECHNOLOGY

Team: E13-03

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*Problem statement:*

Nowadays, congestion in traffic is a serious issue. Making an intelligent or smart traffic is the need of the hour. The time spent idling at lights but can also be useful for reducing accidents which occur at or near to the traffic lights.

*Design:*

The traffic congestion can also be caused by large Red light delays, etc. The delay of respective light is hard coded in the traffic light and it is not dependent on traffic. Therefore for simulating and optimizing traffic control to better accommodate this increasing demand arises. In this project we shall study about the optimization of traffic light controller in a city using a microcontroller and proximity sensors. By employing this technology we can reduce the possibilities of traffic jams, caused by traffic lights, to an extent.

*Working modes (Advanced):*

The Intelligent Traffic Light control system made in this project will be employed to work in three modes. The first mode shall use the real time information, the second mode will be using the machine learning techniques to give the present output in cases the first mode cannot be run by the system and the third mode shall be used in case of emergency.

The inductive infrared proximity sensors are mounted on the road at multiple points to detect the vehicles on the road. The presence or absence of a vehicle is sensed by a sensor assembly mounted on each road. This acts as an input to the microprocessor embedded in the Intelligent Traffic light control system. The algorithm in the processor considering various factors generates an output signal in forms of red, amber or green and the algorithm will also facilitate us to give a time limit for a particular signal at particular time of the day.

If in case, a sensor fails or multiple sensors fail at the same time than the intelligent traffic control can be made to work in the second mode. The second mode basically works on the regression techniques used in the machine learning. The Intelligent Traffic Light control system can store the previous signaling rate done by the system in the past and then using this data from the database can generate its own signaling pattern for the present day. The second mode of operation of our control has its own weaknesses and strengths. The strength being that it uses the machine learning algorithms to perform predictions and the weakness being its needs a storage device to store the information and it needs huge data for improving the accuracy of the signaling pattern.

The third mode of operation is used in case of emergency vehicles using the traffic signal. The emergency vehicles having a tag which communicates with our Intelligent Traffic Light control system can override both the first and second mode. The emergency vehicles will be given the highest priority and a green signal will be generated by the traffic light. This mode can help emergency vehicles like ambulances and police officers to reach their destinations quickly.

This project when implemented across all Traffic lights in a city can drastically reduce the time spent by people to reach their destination. These traffic lights should be synchronized across the city for much better optimized results.

