

INTELLIGENT TRAFFIC LIGHT CONTROL SYSTEM

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ABSTRACT: Our project is aimed at Intelligent Traffic light Control and Management System which uses intelligent components like RFID, IR sensors, microcontroller, etc. Using sensors it gets information about traffic on each road. We can control the traffic signal time and handle the traffic jam on each road by using this traffic information. We can place IR sensors on each road which sense the vehicle and it gives the information about traffic on each road. Also it can adjust the traffic signal time according to traffic level on each road. It will compare all four roads and calculate the density of vehicle on all roads then green signal is given to more traffic lane and red signal is given to other lane. It also consists of modules for i) Allowing emergency vehicles like Ambulance, fire truck VIP, etc. ii) Common people will get information about the traffic density in particular lane. iii) Preventing signal jumping by automated fine deduction. RFID sensor is used to identify the vehicles and IR sensor is used to get the vehicle count. RFID sensor is use frequency of 125 KHz.

INTRODUCTION:

Our project aim is to minimize the delay on road by reducing traffic on road automatically and manually using intelligent traffic light control system. Now a day there is no proper efficient traffic system, providing the one way efficient traffic system is by changing traffic lights dynamically based on traffic density or size. Also there is no proper emergency service for any emergency vehicles like ambulance hence some services other than normal services must be provided to emergency vehicles. People faces traffic jam due to lack of notification hence must be regularly notified about current traffic conditions if he wishes to. We will use this system to reduce traffic congestion which results in long waiting times to turn green signal, loss of fuel and money. Some strict action is required against the rule breakers such as fine deduction or in worst case license expired.

The problems are faced due to traffic congestion are as follows;

1. The Heavy traffic jam
2. No traffic in particular lane but still need to wait.
3. The Emergency vehicles are waiting due to traffic congestion.
4. Lack of traffic information for the users.

So there is a quick need to solve these problems for efficient management of traffic.

LITERATURE SURVEY

Traffic maintenance on the road has become a big issue for today's life. The efficient traffic management technique is needed to reduce waiting and travelling times, save fuel and money. We are known to the fact that, number of vehicles is increasing exponentially, but infrastructure for transportation we have, is not sufficient to satisfy their needs. Due to this, peoples are not going in time what they are exactly planed and correct time of public is being lost every day. This also leads to huge financial problems for the peoples. Main problem occurs when this traffic jam costs life of someone. It should not be surprising that more traffic jam affects almost all emergency vehicles, which can be too much hazardous to affected people exact time what they are plane to reach their place. There isn't any quick solution for this. Government can't continue making roads everywhere.

Now a day the traffic system is not up to date there is no update of traffic density also there are no emergency services provided for emergency vehicle such as ambulance. Traffic jam is the main cause of inefficient traffic system and it occurs because peoples are not aware of current traffic density or size. No strict laws have been implemented for rule breakers. There is a drastic need to solve these problems for efficient flow of traffic system and save the people time and fuel. Generally traffic light controllers use microprocessors and controllers which used predefined hardware and have no flexibility for modification on real time basis. This results in wastage of car fuel and waste people time, so they have implemented traffic signal controller with powerful hardware interface.

BLOCK DIAGRAM:

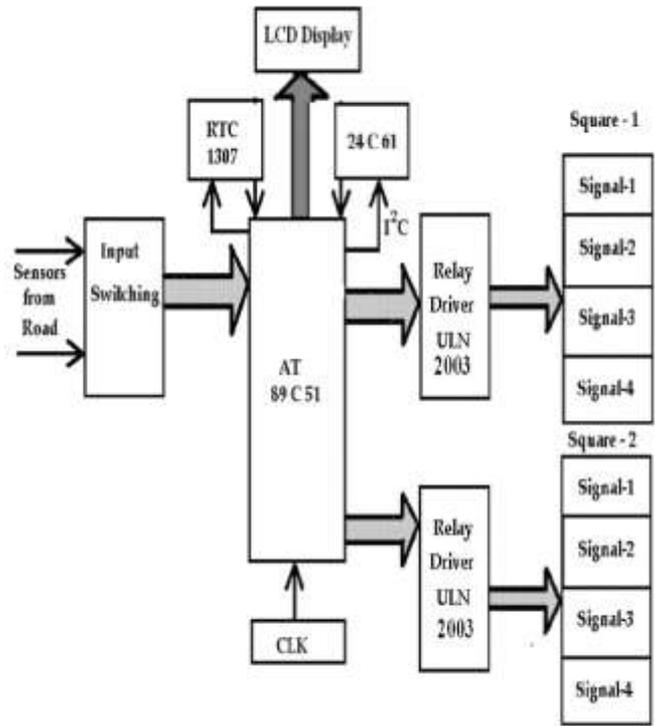


Fig 1: Block diagram of ITLCS

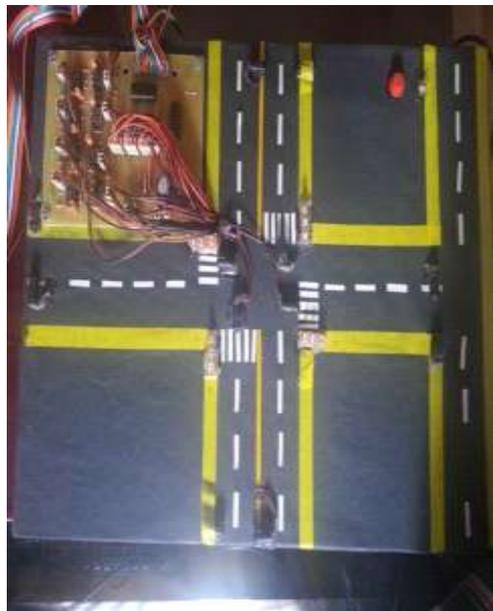


Fig 2: Project Implementation of ITLCS

METHODOLOGY:

In our project we are using two sensor IR sensor and RF sensor. The four IR sensors are placed at the four sides of the road and also one RF sensor. At starting or normal working condition like not heavy traffic at a particular lane it will provide normal 3 seconds for particular lane. If there is a heavy traffic then IR sensor will find the density of particular lane or road and it will send the information to the microcontroller. Microcontroller will decide the time for particular lane according to the density information provided by the IR sensor and it will gives the signals for the lane orderly. The same procedure will continue for all lanes. If any emergency vehicles like Ambulance or Fire brigades comes at any road RF sensor will identify that vehicle and clear the traffic for that lane providing green signal and red signal to other lane. The same will happen to remaining lanes cyclically.

APPLICATIONS:

1. Increases the traffic flow.
2. Reform the vehicle throughput.
3. Control the time delay of the traffic light.
4. Maximizes the intersection capacity at the same time.
5. Minimizes the waiting of vehicles in traffic jam and reduces environment effect.

ADVANTAGES:

1. Simpler, user friendly, easy to program.
2. This system is quick response to change in traffic.
3. This system will reduce the heavy traffic jam.
4. This traffic system will reduce the fuel consumption and money.
5. It will save wasting of time in the traffic jam and reduce the environment effect.

EXPECTED OUTCOME:

The expected outcome of our traffic system is to solve people problem on junction without human in automatic mode and with human interaction in manual mode. Our traffic system is to provide control on traffic jam using automatic and manual mode (for example if any rally comes then set manual mode by setting time). So even if any emergency vehicle detect by sensor then give path to these vehicle providing green signal to that lane and set traffic system as it is. So traffic problem is easily solved and it will reduce time and fuel consumption by using intelligent traffic light control system.

CONCLUSION:

The dynamic change of state using background referencing method is successful in solving the issue of fixed timing of controller in controlling traffic and consequently it will minimize the traffic congestion or peoples are wasting their time on the roads and save the fuel consumption. The use of real time data obtained through RFID sensor technique that serves as input to traffic light will be an innovative way of controlling traffic volume in developing countries. Also the logs obtained are used to send traffic density to users so that congestion or traffic jam can be controlled. Licensing control module will provide discipline in users and it can be minimizing the breaking of traffic rules by the peoples. With stolen or any rules breaker vehicle detection, the signal will automatically turns to red, so that the police officer can take appropriate action, if he/she is present at the junction. Emergency vehicles like ambulance, fire trucks, need to reach their destinations at the earliest.

If they waste a lot of time in traffic jams, precious lives of many people may be in danger and waste of vehicle fuel and their time. With emergency vehicle clearance, the traffic signal turns to green as long as the emergency vehicle is waiting in the traffic junction. The signal turns to red, only after the emergency vehicle passes through.

FUTURE SCOPE:

Further enhancements can be done to the prototype by testing this traffic management system with longer range RFID readers and long range IR sensors. Currently, we have implemented this system by considering one particular road of the traffic junction. But it can be improved by extending to all the roads like in a multi-road junction. By implementation point of view we considering this system is more reliable or useful for public and serialized while implementing it on broader scale we can use distributed computing and parallelization of high level. We can also implement this same system in automated toll gate system in highway.

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