

Traffic Management System

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Abstract: This describes about the “Traffic management System” will control the flow traffic based on density of the vehicles on one side. Sensor will detect the vehicle and we will give the total number of vehicles. If there are greater number of cars on one intersection then the signal time for that side will be increased. By using this idea we have to control the accidents in roads sides and in foreign countries they can follow this implementations but in india there is no .so it will reduce the accidents.

Keywords: Hospital, Patient, Medical, Doctor

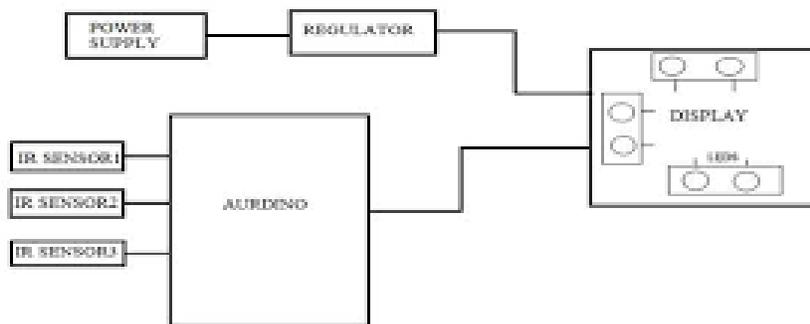
I. OBJECTIVE

Traffic lights consist of three common colored lights. It consists of green light which allows traffic to proceed in the indicated direction, yellow light warns the road users to prepare for short stop, and last one red light signal prohibits any traffic from continuing. time delay.

The intended system checks the direction having larger concentration of vehicles and shows green light to the direction. Vehicle detection system is interfaced with Arduino mega microcontroller board and positioned in all the directions of a junction.

II. METHODOLOGY

As we all know that traffic congestion is a major problem from a long time and traffic administration is also trying overcome this serious from a long time. So as a result, one solution has been deducted which is controlling the traffic on time delay. The basic idea of this paper has been taken from the foresaid concept. According to that idea the traffic signal switches after a certain interval of time. The time interval is controlled by any microcontroller. This was a very basic step towards the optimization of traffic on road but this was not up to the mark. So, to control the traffic in a smarter and efficient way this project has been made by modifying the previous idea. The new idea is doing its job good as it has been seen that traffic jams are reduced and also the crucial time of the citizens are saved.



If there is traffic at all the signals, then the system will work normally by controlling the signals one by one.

If there is no traffic near a signal, then the system will skip this signal and will move on to the next one. For example, if there is no vehicle at signal 2, 3 and currently the system is allowing vehicles at signal 1 to pass. Then after signal 1, the system will move on to signal 4 skipping signal 2 and 3.

If there is no traffic at all the 4 signals, system will stop at the current signal and will only move on the next signal if there will be traffic at any other signal. The integrated system of this density based traffic control consists of an IR sensor for input, an Arduino UNO microcontroller for data interpretation, a red, yellow and green LED for traffic light lighting and an LED Dot Matrix Module for output of this project. The integrated system of this density based traffic control consists of an IR sensor for input, an Arduino UNO microcontroller for data interpretation, a red, yellow and green LED for traffic light lighting and an LED Dot Matrix Module for output of this project.

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The first and primary element of this system is the wireless sensor nodes consisting of sensors. The sensors interact with the physical environment means vehicles presence or absence while the local server sends the sensors data to the central microcontroller. This system involves the 4*2 array of sensor nodes in each way. This signifies 4 levels of Traffic and 2 lanes in each way. The sensors are ultrasonic sensors which transmits status based on presence of vehicle near it. The sensor nodes transmit at specified time intervals to the central microcontroller placed at every intersection. The Microcontroller receives the signal and computes which road and which lane has to be chosen based on the density of Traffic. The computed data from Microcontroller is then transmitted to the local server through Wi-Fi connectivity.

The controller makes use of the collected data to perform the Intelligent Traffic routing. In this system, the primary aim is to gather the information of moving vehicles based on WSN to provide them a clear path till their destinations and traffic signals should switch automatically to give a clear way for these vehicles In this proposed system, the traffic lights are LEDs and the car counting sensor is an ultrasonic sensor. Both blocks are connected to a Microcontroller using physical wires. The Microcontroller is the traffic light controller which receives the collected sensor data and manages the traffic lights by switching between green, yellow and red. The Microcontroller computes the number of cars in the street of the intersection it is monitoring based on the distances measured by the ultrasonic sensor and the timing between those measurements. The Microcontroller then sends the number of cars every minute to the local server. This communication is done using the Microcontroller serial port. The local server exchanges the data received with the cloud server in order to better predict the changes in timings of the traffic light. This communication is done using Wi-Fi. More specifically, the cloud server uses an equation that takes the data received (number of cars) as input then determines the time interval of LEDs needed for a smooth traffic flow. This calculated time is then compared to the current actual time of the LEDs (this data is saved in a database on the cloud server). The server then comes up with a decision. If the current actual green time is less than the calculated time, the decision is to increase the green time, else to decrease the green time.

2.1 Basic Function

Following are some basic functions of the Traffic management System to improve traffic flow

1. Detecting congestion.
2. Synchronizing activity between traffic lights.
3. Updating traffic light timing in real time.
4. Updating and informing drivers of ideal speeds.
5. Prioritizing transportation flow.
6. Reduce congestion and time spent on the road
7. By reducing congestion it will decrease pollution

2.2 Results and Discussions

Traffic is frequently contemplated as a type of fluid flow network, just like an electrical circuit. Nevertheless, what is different about the fluid network is that the flow is alternating, halting at Red lights, and begin again at Green lights. It is the aim of the traffic engineer to make perfect or upgrade the traffic flow within a given road network. The proposed work was compared to the other researcher works, and it was far better in term of low cost, and programming time. For example, some authors used VHDL code, and ALTERA kit to achieve four lane intersections which are more complex and expensive compared to the proposed method which the design is based on microcontroller, and easier to implement on Arduino platform. The Other benefit of this proposed work to the university, and the road user are: Helps movement and help conduct an orderly flow by giving right of way to cars and not others. Helps lessen the number of accidents at the proposed area. Also help university management to disseminate useful information via LED advertisement display such as special announcement, activities on campus, weather forecast, and so on. The proposed controlling technique was compared with other techniques that used different methods to achieve their various results but none of the authors ever thought of incorporating LED adverting display with traffic light system or taking the advantage of using Red light wait time to disseminate useful information. This showed a good performance in term of optimizing Green time amount as needed, Incorporated LED advertising displays by utilizing Red light wait time to disseminate useful information, also maintained a good, and standard stability at all level of demand.



The Automated Traffic management System is one of the effective tools for enforcement of traffic rules on Indian roads in a transparent manner. The system aims at harnessing strength of technology and minimise human intervention to bring about the speed and transparency in the whole process of traffic regulation which will go a long way in solving the problems of traffic on roads to a great extent. The Automated Traffic Monitoring System for enforcement of traffic rules has been in existence in one or the other forms in Western Countries for more than 50 years.

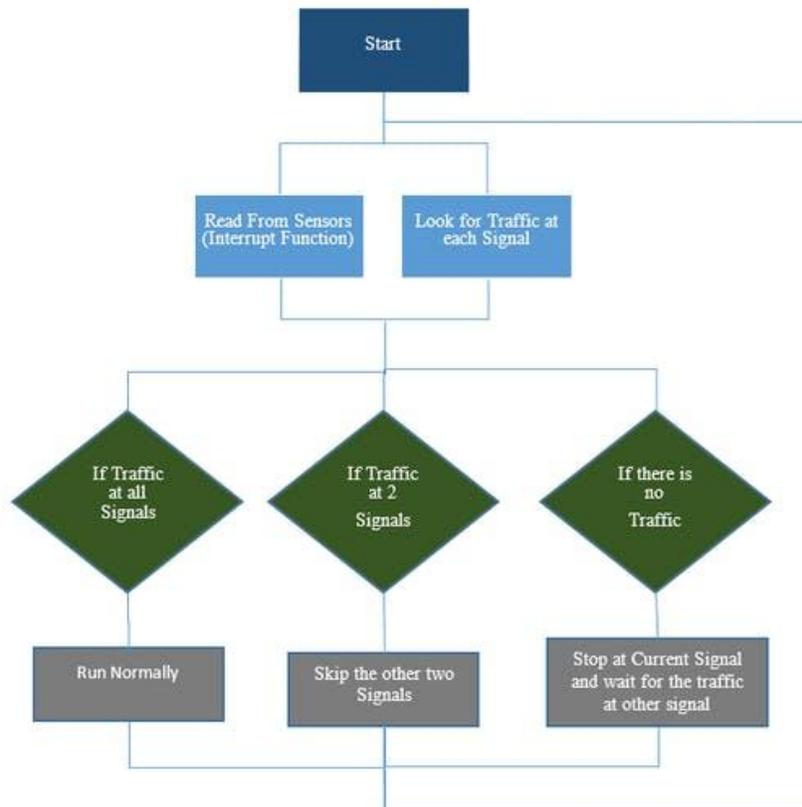
Automated Traffic management System will have following advantages over the manual Traffic monitoring and Challenging System

1. Will help in bringing more safety on roads
2. Will result in reduction of rash and negligent driving

3. Will avoid conflicts between police and public
4. Will increase awareness of traffic rules and regulations
5. Will reduce processing and disposal time of traffic violations
6. Will bring transparency in enforcement of traffic laws and rules
7. Will be used as an effective tool of e-governance to manage, monitor and administer viii) Will empower traffic police personnel who monitor the traffic on the field by giving them wider reach and capability to penalize the erring motorists.
8. Will be helpful in enabling wider use of punitive actions such as suspension of Driving License, Registration Certificate and permits as provided in the IMV Act
9. Will be a great facilitator in identifying frequent violators and initiating appropriate correctable action
10. Will help in gathering complete data of motor vehicle owner's address, license holder's particulars and violation particulars.

III. CIRCUIT DIAGRAM

3.1 Working

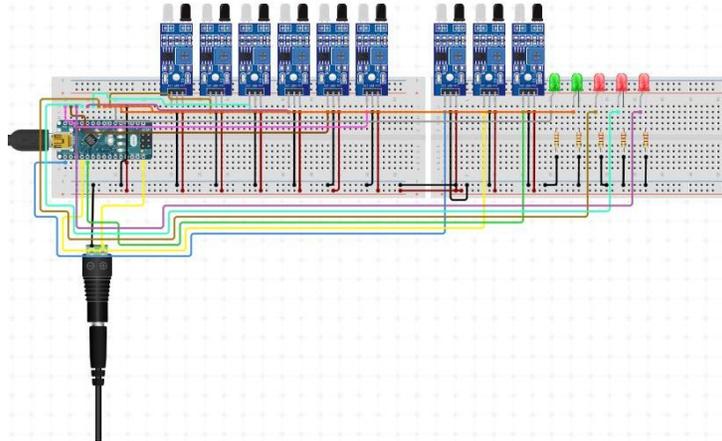


Working of the Traffic management System

The traffic determination is done by IR sensors on each path. Using the details provided by the IR sensor we can guide the traffic signal to work efficiently with the traffic flow. The traffic density on each road determines the change of the timing of the signal. The road with the least traffic is assigned with the red signal and the one with the most traffic is assigned the green signal.

- If there is traffic at all the signals, then the system will work normally by controlling the signals one by one.
- If there is no traffic near a signal, then the system will skip this signal and will move on to the next one. For example, if there is no vehicle at signal 2, 3 and currently the system is allowing vehicles at signal 1 to pass. Then after signal 1, the system will move on to signal 2 skipping signal 2.
- If there is no traffic at all the 3 signals, system will stop at the current signal and will only move on the next signal if there will be traffic at any other signal.

Circuit Diagram



IV. CONCLUSION

This system concludes that using the method of density based control of traffic lights to save a considerable amount of time and also prevent the excessive traffic jams thus leading to smooth traffic flow. In India, the running system is time based to control the traffic signals and people experiencing a heavy traffic jam all over which in turn consumes a lot of time and fuel. We hope these methods will be earlier adopted so that the limitations are experienced with the present method can be overcome.

In conclusion, development of this density-based traffic control system using IR sensor is done very well. By applying this system, it can reduce traffic congestion especially during peak hour and hence also can reduce road accidents in the present and future since traffic density will always increase as the population increases. The usage of Arduino Nano microcontroller contributes a very appropriate mode.

In order to implement the embedded control system because it is easy to be modified to any possibility in meeting future requirements hassle-free and quickly. In the upcoming times, enhancement to improve the features of this project can be done such as changing the power source of the traffic light to solar power panels in order to lessen the electricity usage and hence can contribute to green energy. LED light also can be used in the future for the traffic light since it will decrease the energy consumption which can save up to 90% of energy and cut cost too. Besides, LED light has a long life service which can minimize the operating and maintenance cost. Most important thing is LED light offers better visibility even in direct sunlight.