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Traffico-Advanced Traffic Controller

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Abstract:- **Traffico is an Arduino based Advanced Traffic Controller. The main idea of the project is to minimize the traffic in populated cities. The project focuses on monitoring and managing the moving traffic efficiently. This project is indigenously designed and developed for Indian Roads which helps densely populated area to clear the traffic and in the process, smoothens the traffic. There would be sensors attached to the cameras which would detect the density on the road, and according to the availability of the next signal it operates the signal, rather than the old school way of timing the signals.**
This is real-time signal management rather than the process of waiting for the signal to open even if the road is cleared. The use of Heat Maps enhances the view of roads and traffic. The project includes various features such as automatic traffic control system, CCTV monitoring etc which would be widely beneficial for managing the traffic. The inductive loop detector which is the most widely used sensor in modern traffic control systems will be used in the project.

Index Terms: Inductive Loop, CCTV, Arduino, Density Control Sensor, Heat Maps.

1. INTRODUCTION

In the current day scenario traffic problem in metro cities is a very serious issue. The number of vehicles on the road has increased considerably over the decade. People are wasting more of their time traveling rather than utilizing it for their own good.
The present-day traffic system is old school and is inefficient in managing traffic specially in the metro cities. Hence, a reliable and efficient traffic control system is required. The project Traffico is an Advanced traffic control system which makes use of Arduino for controlling the traffic signal automatically and makes the travel hassle-free.
An average person in a metropolitan city wastes approximately one hour or more in a day due to traffic congestion which leads to a lot of health issues and accidents as well. In order to minimize these drawbacks Traffico could be very helpful.

2. RELATED WORKS

Several researches are being carried out for traffic monitoring in the recent years.

The author Zhang Yuye et.al.[1] system use AT89C51 and CAN BUS controller which leads to complicated design and cost of the system more because of CAN BUS controller. Using AT89C51 power requirement will be more but the proposed ARM7 based traffic control system will use low power Atmega16 microcontroller. So reduce the power required. The author Manoj Kanta Mainali et.al. [2] system used genetic algorithm approach to estimate the traffic volume in road sections without the traffic information on road sections. The system can estimate the unknown traffic volume using only the known traffic volumes. So, proposed ARM7 based traffic control system use the advantage of [1][2] to design very efficient system that use the combination of ARM and AVR. The author Xu Li et.al. [3] carried out a performance evaluation study by utilizing the existing vehicle- based sensors in taxies for traffic monitoring. A performance evaluation has been carried out in Shanghai, China. ARM based traffic control system based on vehicle density calculation to reduce traffic congestion carried out in India. The author Promila Sinhmar et.al. [4] the system use Image processing to traffic light control and monitoring system. The microcontroller is connected to a computer through a serial communication cable so hardware cost is more.

3. METHOD

Arduino, an open-source platform will be used in this project. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on the computer, used to write and upload computer code to the physical board.

Heat Maps are also used to enhance the view of roads and traffic.

Heat maps enable us to quickly identify store hot spots, dead areas and bottlenecks. Systems take images from networked (IP) cameras to help you visualize customer traffic patterns over time as well as in real time. This information is available anywhere on the network.

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The density control sensor coordinates with the signal camera to gather the images and data which is then processed by the Arduino. The Arduino then processes the data to form a heat map and operate the traffic signal accordingly.

4. CHALLENGES AND FUTURE SCOPE OF ADVANCEMENT

The will be many challenges in managing the real-world traffic scenario.

In metropolitan areas, the key problems are pedestrian and bicycle traffic accidents, the perceived lack of safety in school travel, the difficulty in predicting travel and transport, environmental issues, poor functionality of travel chains, deteriorating conditions for pedestrian and bicycle traffic and public transport, and the increase in passenger car traffic. Major metropolitan areas also suffer from traffic congestion and incipient shortages of space reserved for traffic. Even after completion of the project implementing it such a big country as India is again a big challenge as people will take time to adopt to the new changes.

5. CONCLUSION

With massive growth in urbanization and traffic congestion, TRAFFICO-Advanced traffic controller is needed to reduce the traffic delay and travel time especially in countries like India. Also, the components used in the system are cost efficient. The main aim of developing this system is to minimize traffic in populated cities specially the metropolitan and Tier I cities. The system will ultimately, improve the traffic system and save time and improve the living of people.

6. FUTURE WORK

The Traffico in future will focus on extension of maps and also the accuracy of data and maps. Traffico would also deal with the alert systems such as contacting the ambulance and police if an accident occurs. The project would also help in maintaining the records of people who are often breaking traffic rules. One advantage of the project would be that it would automatically fine people in case of any traffic rule lapse and send the receipt directly to the registered vehicle's owner's address. Research will also be done in order to improve the efficiency of the maps. This system will help to serve people better in travelling and provide them a better experience. This will help in reducing the traffic and also the minimize the human effort.

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