

An Implementation Paper on Congestion Handling Organization Using Cybersafe

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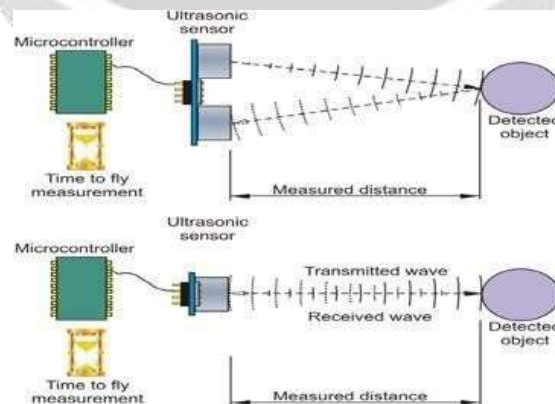
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Abstract

Controlling unwanted Traffic is considered one of the major dimensions of a smart city. India is the next most peopled country in the entire world with an approximate growing number of 1.37 billion. As an outcome, traffic congestion issues is becoming more frequent, and systematic traffic control and the management is becoming a complete and urgent essential requirement. Normal traffic structure do not have a genuine observing system and frequently needs manual handling at the traffic joint. This does not only cause mental pressure in travellers but also a large amount of fuel to go wasted because of delays at traffic joint. Traffic crowding and accidents caused by overspeeding vehicles have been a prime cause for concern in societies due to their negative outcomes such as stress to daily travellers, the release of more toxic vapour into the atmosphere, accidents, and loss of fruitful hours. This paper offers an approach for controlling traffic congestion and overspeeding lawbreakers. This Survey provides a detailed explanation of how to decrease manpower and also the price of traffic control with well organized preservation structure. The advanced survey will increase the safe flow of the traffic and decreases confusion in traffic management. People to reach their destinations on time has led to an increase in congestion, causing significant time wastage. The current fixed-duration traffic light method is inadequate in solving this problem, and an alternative method is required. This paper presents a possible solution by making traffic signals smarter, where density is detected by sensors, and the data is processed on a microcontroller. Each traffic light is allotted.

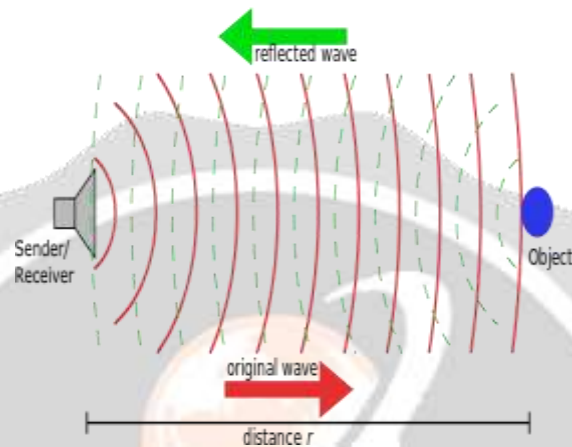
Keywords—Internet of Things (IoT), Traffic, Congestion, Traffic signal, Automobiles.

Fig 1. Working Principle of Ultrasonic Sonar



Introduction

This paper provides an introduction to IoT (Internet of Things), covering its definition, status, components, and standards. It also explores potential business models for implementing IoT in a traffic simulator. To address the issue of traffic congestion, an efficient caution light system is proposed, which uses ultrasonic sensors and an Arduino mega 2560 microcontroller to read and process automobile density, thus managing traffic flow to reduce congestion. By implementing such an efficient management system, travel time can be improved, road safety can be enhanced, and traffic congestion can be minimized. The growing number of vehicles and the need for congestion.



Traffic Service Outline

Traffic simulation involves using computer software to create mathematical models of transportation systems, such as highway junctions, arterial paths, roundabouts, and midtown grid systems. This helps in planning, designing, and operating transportation systems more effectively. One such solution is the "Traffic Stimulator," an autonomous traffic control system that uses advanced technology to reduce traffic congestion and manage traffic signals.

In India traffic is major problem which leads to stress, and it is caused due to over growth in population and the needs and demand of humans. To solve this problem, we introduce this project which smartly judges the density of vehicle crowd and according to it control the traffic signals.

The Traffic Stimulator system includes the Arduino Uno Microcontroller and all of the sensors required to navigate the robot around its environment.

Implementation proposal

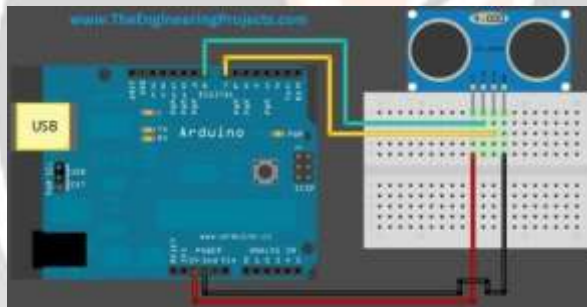
The exponential growth of vehicles on the roads is causing increasing traffic congestion and time wasted in traffic. The current method of managing traffic using fixed duration traffic lights is not effective in reducing traffic congestion. However, the development of "smart" traffic signals has emerged as a potential solution. This paper proposes using ultrasonic sensors to detect the density of vehicles on the roads. The sensors transmit this data to a microcontroller, which processes it and adjusts the duration of each traffic light based on the denseness of vehicles in each path.

The use of ultrasonic sensors in detecting vehicle density is a significant breakthrough in traffic management. Unlike the traditional methods of detecting vehicle density, which use induction loops or video cameras, ultrasonic sensors are less expensive and more accurate. The data is then processed by the microcontroller to determine the duration of each traffic light. The microcontroller ensures that green signals are given for a longer duration to lanes with higher vehicle density, thus effectively reducing congestion and optimizing the flow of traffic.

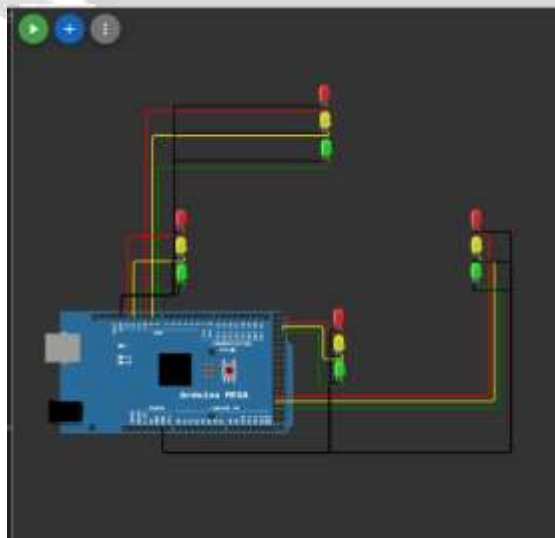
S.No	Criteria	Conventional traffic light system	Proposed Density based traffic light system
1.	Time	Unnecessary time wastage	Saves time
2.	Power	Comparatively higher power consumption	Low power consumption
3.	Energy source	Conventional	Non-Conventional (Solar)
4.	Control system	Manual	Automatic

Fig 2 shows the comparison table of conventional vs proposed methodology

In a study conducted by Anam Firdous, Indu, and Vandana Niranjana, a system was designed to direct the traffic signals based on the number of vehicles in a particular area [3]. The system uses IR detectors to provide input data to the Arduino Uno microcontroller, which calculates the number of vehicles in the area based on the data received from the detectors. This information is then used to control the way in which the traffic signals operate to reduce congestion. The comparison table in Figure 2.2 shows the conventional method of traffic management versus the proposed methodology [3]. Each amber pole consists of three lights: green, orange, and red. The infra detectors detect automobiles based on the reflected sense from the detectors and actuators. These detectors are placed both opposite to and towards the road to ensure effective congestion management.



Service Diagram



Conclusion

Nowadays , there has been a swift increase in number of vehicles in the entire world. There were roughly one million licensed vehicles as per poll last year.

This study is worthy of attention in defining general facts regarding IoT, like definition, market potential , and the level of IoT, which has become a hot IT subject these days, as well as in introducing relevant IoT work models to assist business institutions and research institutes taking part in associated projects building a smart city as a part of the later vision of city governments by sending back the new details pattern of IoT. A limitation of this study, however, is the lack of available data in Korea that hampers the needed actual survey on the benefits of IoT technology. We hope that the further research in this field will be directed in the future.

As a result of this, traffic problems have increased in the last few years and along with that, the present traffic light controllers have limit because they use the same old traditional hardware.

The survey concludes that the current method of managing traffic at the any junction or a signal is of fixed duration where the wait time and go time of the signal are fixed irrespective of the traffic density. We can implement a smart or intelligent traffic signal where the wait time and go time of the signal depends on the density of traffic on respective lanes. We can use appropriate sensors to read the density of the vehicles and process these data to make the traffic dynamic.

