



INTELLIGENT TRAFFIC CONTROL SYSTEM (ITCS) FOR AMBULANCE

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ABSTRACT

Mishandled traffic signals are one of the main issues that commuters encounter every day. The length of the signal does not match the number of vehicles on the road, which leads to a number of problems. The current system, for instance, still operates on a defined time delay if there is no vehicle on a certain side of the road, resulting in that light turning green even when there are vehicles at the other signals. This aggravates the motorist and can result in significant issues like road rage, as well as prompting people to "jump" a signal.

Our team plans to develop a traffic density monitoring system that intelligently modifies the signal based on the amount of traffic in each lane to address this issue.

INTRODUCTION

Traffic congestion has become a significant problem in our day-to-day activities in today's fast-paced world. As a lot of labour hours are lost in the signals, it lowers individual productivity and therefore society's production. The main causes of these tumultuous congested areas are the large number of cars, the poor infrastructure, and the illogical distribution of the signalling system.

Since engines are typically left running, a significant amount of natural resources, such as fuel and diesel, are consumed without producing any useful results, which indirectly contributes to the rise in pollution. Therefore, innovative methods must be introduced by using sensor-based automation techniques in order to eradicate these issues or at least significantly minimise them.

Our idea intends to cut down on traffic jams and unneeded delays during traffic light changes, especially when there is very little traffic. It is intended to be used in areas close to intersections where traffic signals are located in order to lessen congestion there. It monitors the number of vehicles on each route and modifies the timing of each traffic light signal accordingly. The time delay given for that particular traffic light signal will be longer the more vehicles there are on the road.

LITERATURE SURVEY

Over the past few years, the condition of the road infrastructure has steadily improved. Road transportation has become a focus of rapid development as connectivity has grown. Better access to services, simpler transportation, and greater freedom of movement are all made possible by roads. However, when traffic congestion in major cities worsens, it creates a recurring problem in the crowded downtown regions.

The system of urban transportation is significantly enhanced by traffic signals. By selecting the proper signal timing settings, they manage the flow of traffic on metropolitan roadways. Intelligent transportation systems' primary component, adaptive traffic signal controllers, play a key role in



efficiently reducing traffic congestion by making real-time adjustments in response to shifting traffic network dynamics. several strategies for traffic

PROPOSED SYSTEM

An open-source microcontroller board called the Arduino UNO is built around the Microchip ATmega328P microcontroller. A variety of expansion boards (shields) and other circuits can be interfaced with the board's sets of digital and analogue input/output (I/O) pins. The Arduino IDE (Integrated Development Environment) can be used to programme the board's 14 digital pins and 6 analogue pins over a type B USB connector. Although it can operate with voltages between 7 and 20 volts, it can also be fueled by an external 9 volt battery or by a USB cable. The Italian word "uno" (which translates to "one") was chosen to signify the 1.0 release of the Arduino Software (IDE). The Uno board with the Arduino Software (IDE) version 1.0 served as the foundation for later generations of Arduino.

An electrical gadget that produces infrared light to sense certain features of its environment is called a sensor. An IR sensor can monitor an object's heat while also spotting movement. Typically, all items emit some type of thermal radiation in the infrared range. Although these radiations are invisible to the human eye, an infrared sensor can pick them up. An IR LED (Light Emitting Diode) serves as the emitter, and an IR photodiode, which is sensitive to IR light of the same wavelength as that emitted by the IR LED, serves as the detector.

- A pair of IR transmitters and receivers (LM358 IC 2)
- Kilo ohm-range resistors.
- Varying resistors.

The transmitter section of this project includes

An optoelectronic device called an LED operates on the electro-luminance theory. The ability of a substance to transform electrical energy into light energy and then emit that light energy is known as electro-luminance. In the same way, the semiconductor in LED emits light under the influence of electric field. The P-N Junction diode and outward arrow symbols are combined to create the LED symbol. These outward arrows symbolise the light radiated by the light emitting diode. The semiconductor material used in LED is Gallium Arsenide (GaAs), Gallium Phosphide (GaP) or Gallium Arsenide Phosphide (GaAsP). Any of the above-mentioned compounds can be used for the construction of LED, but the colour of radiated light changes with the change in material.

A sound sensor is a tiny circuit board with an electret microphone on it that receives acoustic impulses from the air or free space and transforms them into electrical signals. The sound sensor can produce an analogue or digital output. It is extremely user-friendly, economical, low power, and compatible with common controllers and digital/analog ICs. Sensor inputs can easily incorporate logic modules, and few additional components are needed. This article provides a brief explanation of the sound sensor's operation, circuit schematic, and Arduino interface. The workings of the sound sensor are quite uncomplicated and straightforward. Like a human ear, it functions. A little circuit board that makes up the sound sensor module. The workings of the sound sensor are quite uncomplicated and straightforward. Like a human ear, it functions. The sound sensor module consists of a small circuit board that is a microphone of 50 Hz-10 kHz and operates with the sensor detector module for detection. Other external processing circuitry components convert sound waves into electrical signals. Another important hardware component is the high precision comparator LM393N. This device is mandatory to digitize the electrical signal to the digital output D0. To adjust the sensitivity of the digital output D0, the sound sensor module contains the built-in potentiometer. It contains a microphone called a condenser microphone with 2 charged plates- one is a diaphragm and the other is a backplate. These plates seem like a capacitor. In addition to numerous other applications, musical and stage performances are where this kind of sound sensor is most frequently employed. It is a straightforward,

reasonably priced standalone microphone. The electromagnetic induction theory underlies its operation. It has a diaphragm that a magnet and coil are fixed to in its design. The induced electric current of the incoming sound vibration causes the coil to oscillate in the magnetic field when the sound wave strikes the membrane. This kind of microphone has an inbuilt amplifier, is robust, and can tolerate high-frequency sounds without distorting them.

RESULTS AND DISCUSSIONS



Fig no: 1.1-Density Based Traffic Control System



Fig no:1.2-Time Based Traffic Control System



Fig no:1.3- Sound Sensor Based Traffic Control System



CONCLUSION

Here is exigent need of efficient traffic management system in our country, as India meets with 384 road accidents every day. To reduce this congestion and unwanted time delay in traffic an advanced system is designed here in this project. With field application of this technology, the maddening chaos of traffic can be effectively channelized by distributing the time slots based on the merit of the vehicle load in certain lanes of multi junction crossing. We have successfully implemented the prototype at laboratory scale with remarkable outcome. The next step forward is to implement this schema is real life scenario for first hand results, before implementing it on the largest scale. We believe that this may bring a revolutionary change in traffic management system on its application in actual field environment. The traffic management system could undergo a radical transformation as a result, in our opinion.

FUTURE SCOPE

We will also modernise this system so that when a car tries to move even while a red light, it will sound an alarm to notify the driver and send a photo of the warning to the traffic warden.

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