

Artificial Intelligent Vehicle Speed Control System Using RF Technology

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Abstract— Traffic congestion is nowadays leads to a strong degradation of the network infrastructure and high number of vehicle which is caused by the population. With increase in number of vehicles and the transportation demand, traffic congestion is occur. Conventional techniques are unable to handle variable flow with time. Hence the accident ratio is increases

We all know that in order to control traffic and for the safety of public, traffic signals are used. These signals are generally seen where two or more roads are connected to each other. These traffic signal rules are not generally followed by the people either due to lack of attention or due to speeding of vehicles which causes accidents frequently. Though accidents due to lack of attention to traffic signal cannot be avoided but accidents due to speeding of vehicles near traffic signals could be avoided.

In order to avoid such kind of accidents near traffic signals; ‘smart signal system’ should be introduced. This system takes the total control of vehicle in its own band. This project consists of two separate modules, i.e. transmitter and receiver. Transmitter will be attached to signals and receiver will be attached to vehicles. The information in form of signals are sent by system and then are received by the receiver attached to the vehicle. The vehicle control unit automatically alert the driver and reduces the speed automatically. This system takes total control of vehicles for few seconds. . The proposed technique uses small system to avoid accidents and hence safety is achieved.

Keywords— AI, RF, ULTRASONIC, AVR, IR.

I. INTRODUCTION

Now-a-days accidents occur frequently resulting to increase number of deaths. Out of total number of fatalities and serious injuries 27% of fatalities and 19% of serious injuries occur due to speeding of vehicles. In order to stop these accidents RTD has implemented various types of rules, but due to lack of awareness and attention these rules are not followed by every person, which leads to accidents.

Consider the example of traffic signal. Traffic signal consists of three lights: Green, Yellow, ad Red. Every light represents its own rule. Such as Red represents to stop the vehicle. Green permits the flow of vehicle. Yellow represents to deceleration of vehicle. In this system, Yellow light plays very important role, which represents Deceleration of vehicles. When Yellow signal turns to red it represents the stoppage of vehicle completely, but during that time certain people increase the speed of vehicle to cross the signals before red light appears which may lead to accidents.

In order to avoid such accidents, smart traffic system should be designed. This smart traffic system consists of two separate module transmitter and receiver. This smart system first satisfies the condition of Yellow –Red light then detects the vehicles. As soon as it detects the vehicles it provides the information to vehicle controller which automatically decreases the speed. In this case if driver tries to accelerate the car; this system restricts the car to move. This system avoids such types of accidents by taking full control of vehicle. It is difficult but a powerful system to control such type of conditions and avoid accidents.

II. WORKING PRINCIPLE

Transmitter

Above figure shown as a transmitter diagram which is connected in traffic signal. In transmitter we use AVR microcontroller which require a 5V power supply, which is provided by power supply section. Here we use four traffic signals which are connected at four different roads. If desired condition is obtained at a particular signal then that signal calls to microcontroller. Then microcontroller provides information to RF transmitter for transmitting signals. Then RF transmitter starts transmits the 434MHz of RF signal.

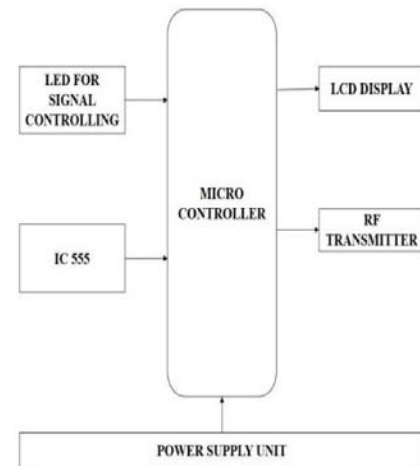


Fig. 1 Block diagram for transmitter

Receiver

Above figure shown as a receiver diagram which is connected in vehicles. Here we use AVR microcontroller which require a 5V power supply. RF receiver receives the transmitted signal and calls to microcontroller. Then microcontroller provides information to motor driver which control the DC motor. In motor driver, there are two terminals; enable1 and enable2. When these both terminals are logically '0' then motor will be stop. When these terminals are logically '1', then motor is able to run. If one of the terminal is '0' or another is '1' then speed starts to decreases. In desired condition microcontroller gives command to stop the vehicle step by step.

Here we use LCD display to indicate the speed of vehicle. Also, ultrasonic sensor is used to maintain the distance.

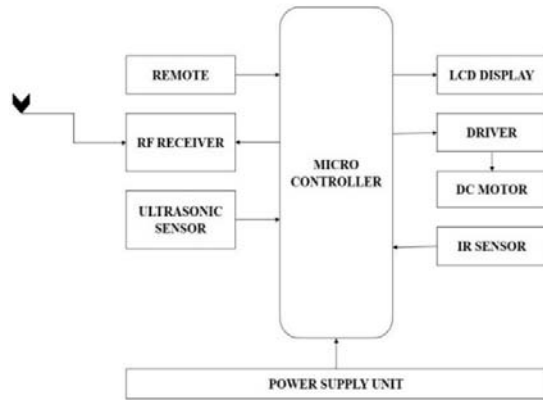
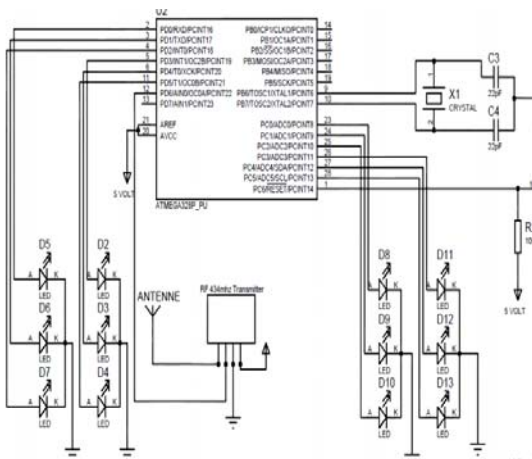


Fig. 2 Block diagram of receiver

Circuit Diagram of Transmitter Section:

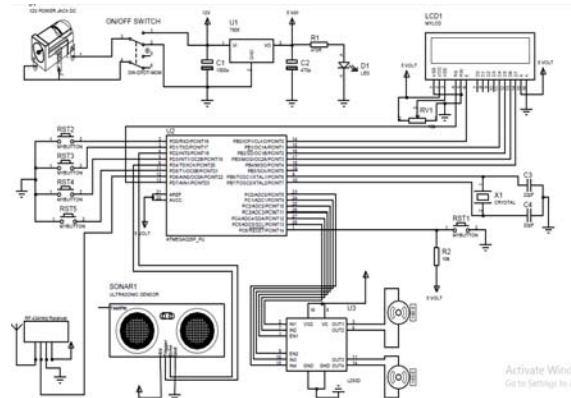
Figure shows as a circuit diagram of transmitter section. Here we use 8-bit ATmega328 AVR microcontroller. This circuit is very simple and easy to construct. It is easy to fabricate with traffic signals. It is designed using Proteus software.

This circuit is implemented in traffic signals to control the desired situation. Here we use RF transmitter having low cost. When desired condition is occurred on a particular road, then RF transmitter transmits signal of 434 MHz



Circuit Diagram of Receiver Section:

Figure shows a circuit diagram of receiver section. Here we use 8-bit ATmega328 AVR microcontroller. This circuit is implemented in every vehicle. This circuit shows complexity because it is mechanically fabricated with vehicle. It is easily implemented in AGV (Automated Guided Vehicles). But difficult to implement in IC engines vehicles. This circuit is designed using Proteus software. This circuit is more-costly as compared to transmitter section.



Circuit Diagram of Transmitter Section

III. METHODOLOGY

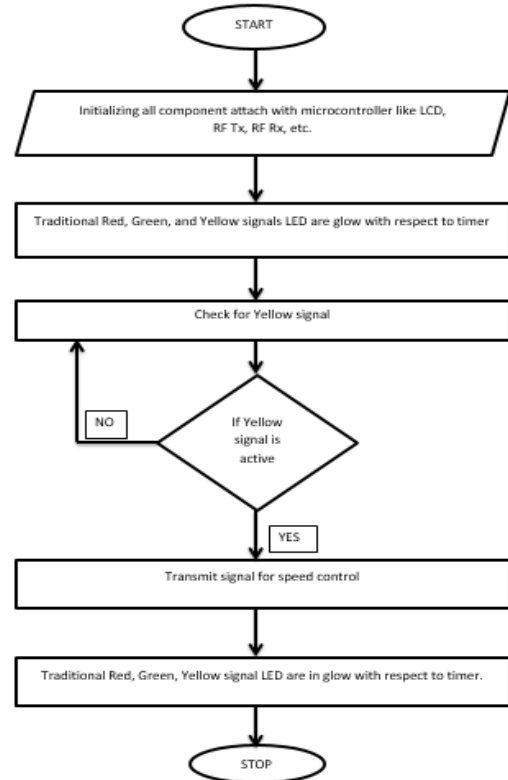


Fig. 3 Flow chart for transmitter

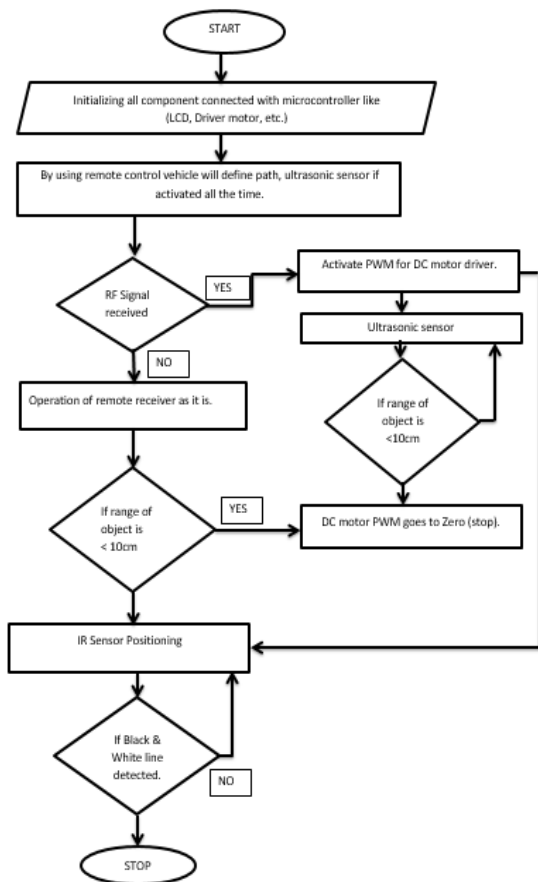


Fig. 4 Flow chart for Receiver

IV..PCB LAYOUT

The first step in the process of designing any electronic circuit is the construction of the layout of that electronic circuit for the circuit board. This preliminary and for most objective is necessary to avoid further confusion in the rest of proceeding. The layout of PCB has to in co-operate all possible information and components on the circuit board, as given in the circuit diagram. After that one can proceed to artwork preparation. While preparing any layout of an electronic circuit the first rule is to be remembered is not to start the designing of the layout unless and until an absolutely clear and is not available. Another important note is to prepare a before a hand PCB layout from component side. This minimizes any further complication. Among the larger ones are placed first and the space in between is filled with smaller ones. All components are not necessary if they have to be replaced.

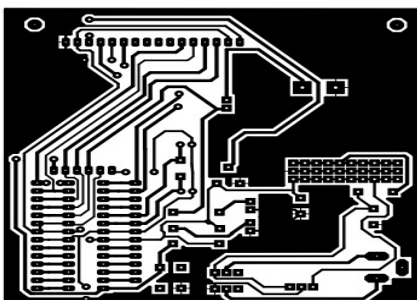


Fig.5 PCB Layout for Receiver

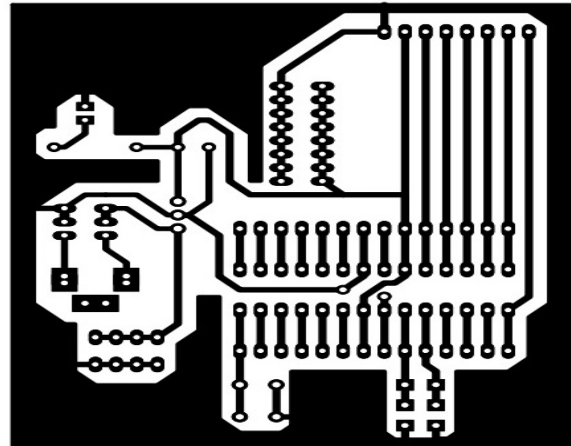


Fig.6 PCB Layout for Transmitter

V. LITERATURE SURVEY:

This paper presents a new design to control the speed of the automobiles at remote places for fixed time. The project is composed of two separate units: Zone status transmitter unit and Electronic Display and Control unit. Once the road-sign signal is received from the zones, the vehicle's Electronic Display Controller Unit warns the driver, to reduce the speed according to the zone, it waits for driver's response and reduces the speed of vehicle automatically. In this model, RFID technology is used but it cannot be implemented in real time because of lower range of RFID. In this system delay is also introduced due to limitations of RFID. To avoid disadvantages of model we use RF transmitter and receiver which has a frequency of 434Mhz. and it covers the range up to 500 feet's. The range can be varied by changing the crystal oscillator in transmitter.[1]

This project is implanted for control the speed of any vehicles automatically in restricted areas such like School, Parks, Hospitals, etc. We take some technical concepts from this project, to implement our project. [2]

VI. CONCLUSIONS

The accidents are automatically minimized at traffic Signals. It also ensures efficient transportation of Vehicle by smooth flow of vehicles. In this paper the prototype design of a system that can deliver road traffic signals to vehicles and can control the speed of the automobile has been demonstrated. This project is very simple which is durable and is of low cost. This project consumes less power. This system is easy to implement on present system which ensures maximum safety for drivers, passengers and pedestrians. The driver can get the information about warning signals. Driving safety will be enhanced and offers a positive cost differential to the government. This project may be enhanced further by establishing vehicle to vehicle microcontrollers' communication through Radio frequency so as to avoid vehicle collisions and to prevent deaths.

VI. ACKNOWLEDGMENT

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