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## IOT BASED SMART HIGHWAYS

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**Abstract:** All over the world, road transportation has increased tremendously. The issue with increased road transportation is undesirable accidents. Accidents are highest in India amongst other countries in the world. The actual number of casualties due to accidents may be higher than documented. There are some particular places where accidents occur more, they are road crossings, turns on highways etc. It is required to minimise the accidents with an intelligent system that alerts before the occurrence of accidents. Also, the accidents on highways can be prevented by understanding the psychological state of driver. This project has proposed a smart system for accident prevention that is an ideal concept for smart roads. This smart system uses sensors to send digital data using internet of things (IoT) to take immediate actions under emergency conditions and to communicate through wireless protocol.

**IndexTerms:** AT89S52 Controller, LCD Display, Power Supply, WIFI Module ESP8266, APR33A3 Voice Module, HT12E&HT12D (Encoder & Decoder)

### I. INTRODUCTION

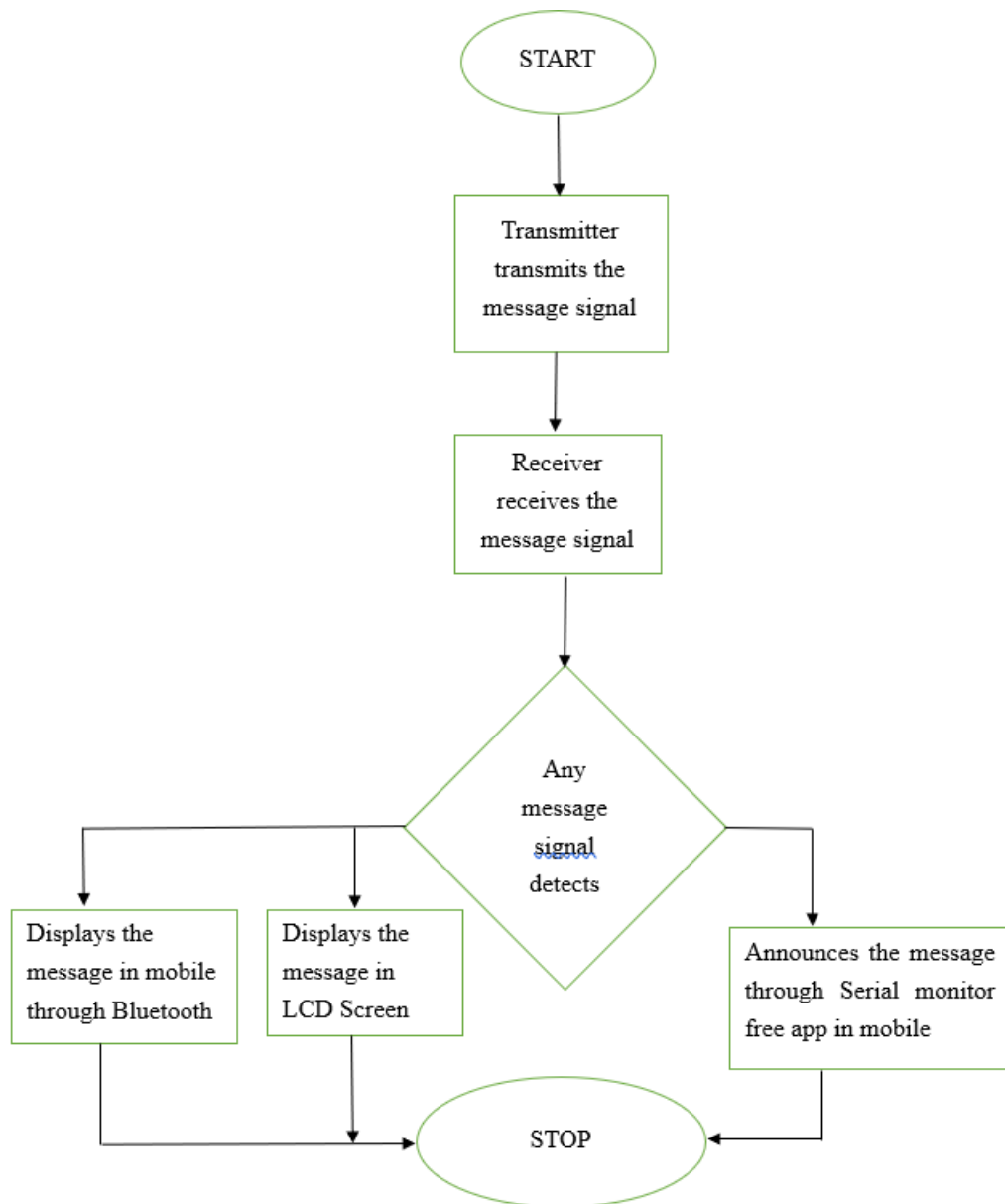
This project has proposed a smart system for accident prevention that is an ideal concept for smart roads. This smart system uses sensors to send digital data using internet of things (IoT) to take immediate actions under emergency conditions and to communicate through wireless protocol. The main object of the propose system is to prevent accident by sensing the nearby zones through signal or message alert through Wi-Fi technology. If narrow Bridge zone nearer to vehicles within few meters it will give alert notification to mobile through Wi-Fi. After this indication the person reduces the speed of the vehicle. Similarly, if school zone is nearer to vehicles within few meters it will give alert notification to mobile through Wi-Fi. After this indication the person can slow down the vehicle.

If an embedded system is designed well, the existence of the processor and software could be completely unnoticed by the user of the device. Such is the case for a microwave oven, VCR, or alarm clock. In some cases, it would even be possible to build an equivalent device that does not contain the processor and software. This could be done by replacing the combination with a custom integrated circuit that performs the same functions in hardware. However, a lot of flexibility is lost when a design is hardcoded in this way. It is much easier, and cheaper, to change a few lines of software than to redesign a piece of custom hardware. IoT systems allow users to achieve deeper automation, analysis, and integration within a system. They improve the reach of these areas and their accuracy. IoT utilizes existing and emerging technology for sensing, networking, and robotics. IoT exploits recent advances in software, falling hardware prices, and modern attitudes towards technology. Its new and advanced elements bring major changes in the delivery of products, goods, and services; and the social, economic, and political impact of those changes. IoT primarily exploits standard protocols and networking technologies.

However, the major enabling technologies and protocols of IoT are RFID, NFC, low-energy Bluetooth, low-energy wireless, low-energy radio protocols, LTE-A, and Wi-Fi-Direct. These technologies support the specific networking functionality needed in an IoT system in contrast to a standard uniform network of common systems. NFC and RFID (radio-frequency identification) and NFC (near-field communication) provide simple, low energy, and versatile options for identity and access tokens, connection bootstrapping, and payments.

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Same as if Fog zone nearer to vehicles within few meters it will give message alert to mobile through Wi-Fi. After this indication the person reduces the speed of the vehicle. By this indication we can reduce the accidents on Highways. In this project we are using IOT module ESP 8266, AT89S52, switches. Here, in this project, IOT module is connected to the controller and using internet from any place speed can be controlled. This project uses regulated 5V, 1A power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/12V step down transformer.

**FLOW CHART:****WORKING PRINCIPLE:**

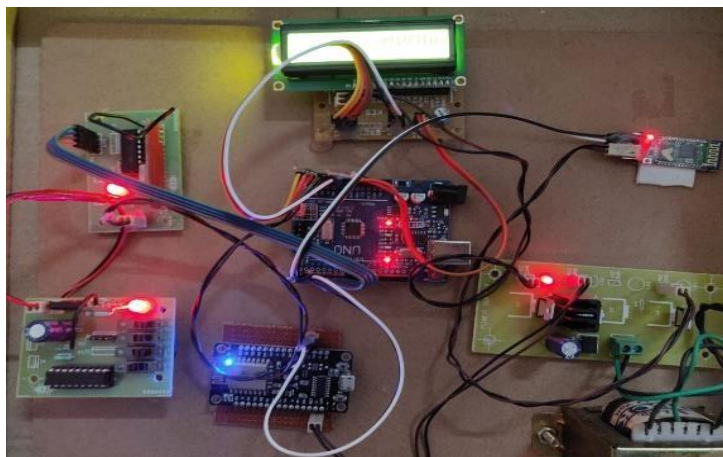
Many of the surveys clearly says that most of the accidents occur near some zones like school zone, restaurant zone, fog zone etc. To prevent accidents by sensing the nearby zones through signal or message alert through wi-fi technology. In this project we are using IoT module ESP8266, AT89S52, RF transmitter, RF receiver. Coming to the working of this project is at first transmitter is placed at a particular zone after a RF receiver is placed in our vehicles so, that whenever the car is about some distance from the zones on the highways.

We are using HT12E, HT12D as an encoder and decoder, HT12E is used to encode the data from transmitter it is placed in RF transmitter and HT12D is used to decode the data from the receiver. It is placed in RF receiver. The main use of HT12E and HT12D is low power and high noise immunity CMOS technology. The Transmitter is first programmed and placed at the particular required zone.

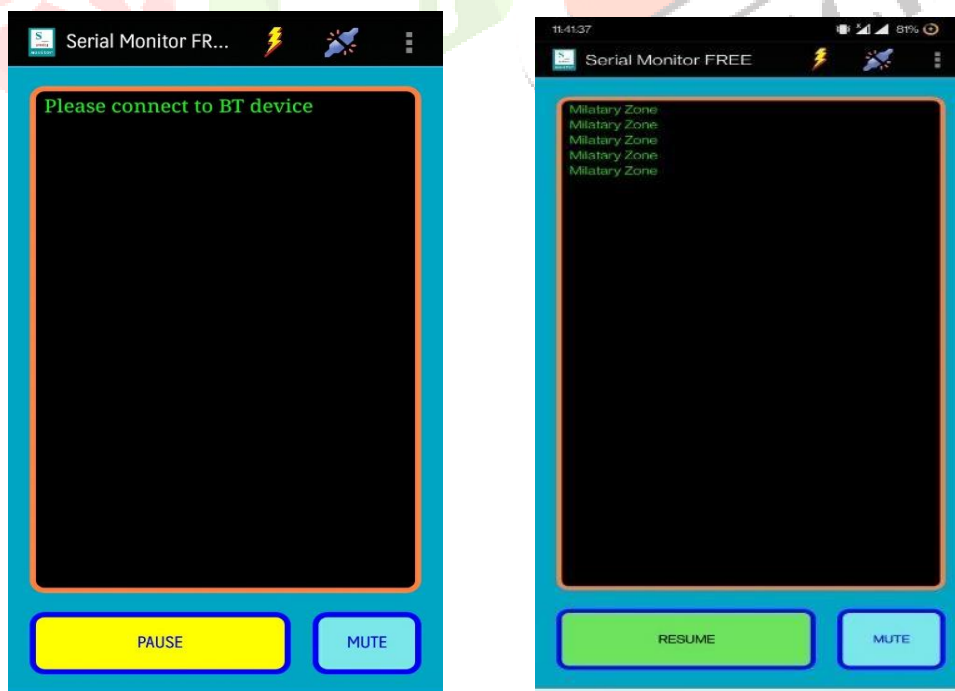
Then the transmitter transmits the Message Signal. In Receiver side it contains Decoder, LCD display, Bluetooth Module, Wi-fi Module. When the Receiver receives the signal, it decodes the signal and displays the message in the LCD display. It gives message on the LCD display like (there is a school zone). Mobile phone is connected to receiver through a Bluetooth Module and message is displayed in an app called “Serial Monitor Free”. It also announces the message through phone speaker.

**RESULTS:**

This project is well prepared and acting accordingly (including all the hardware and software) as per initial specifications and requirements of our project, using highly advanced IC's and with the help of growing technology the project has been successfully implemented.



**Fig 1: Photographic View of IoT Based Smart Highway**



**Fig 4.1.2: Displaying Message in Mobile Through Bluetooth**

In above circuit all the components are connected correctly as per the block diagram and working of project. By using above module, it can detect the accidents on the highways, using highly advanced IC's and with the help of growing technology the project has been successfully implemented.

**ACKNOWLEDGEMENT:**

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