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Speed Control of Vehicle by Detection of Potholes and Humps

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ABSTRACT: The major problem that is occurring in our developed country is the maintenance of roads whereas the identification of the potholes and humps, not only useful to the drivers to avoid accidents or damaged vehicles. This helps us to maintenance of road .This paper which says about the potholes and humps detection on the roads. This gives time alerts to the drivers, it helps to avoid accidents or vehicle damages. Mainly we have used ultrasonic sensors which used to identify the potholes and humps and also measures the depth and height of the roads respectively. The data which are sensed by the sensors include potholes depth and height of the hump and geographic location which is to be already stored in the database.This information serves us a valuable source to the government authorities and vehicle drivers where the application which is used android to alert drivers so that precaution measure can be easily taken to avoid accidents or else flash messages with an alarm sound can also produce audio beep.

I.INTRODUCTION

India is one of the most popular country in the world and it has a fast growing economy. Roads are the dominant means of transportation in India today. However, in India most of the roads are narrow and congested. It has a poor surface quality and less maintenance. Since we are in India driving is a breath holding,potentially threatening affair.

Vehicle population has been increased tremendously increased over the last two decades. Nowadays traffic congestion and road accidents are increasing mainly due to this proliferation of vehicles. Roads in India normally have speed breakers so that vehicle's speed can be controlled to avoid accidents.These speed are unevenly distributed with unscientific heights. Heavy rains and movement of heavy vehicles are the main reasons for the formation of potholes. This also leads to major traumatic accidents and loss of human lives. According to the survey report "Road Accidents in India,2011", a total of 1,42,485 people had lost their lives due to fatal road accidents by the ministry of road transport and highways .

II.BLOCK DIAGRAM

The block diagram of the system is mainly consists of three parts that is microcontroller module, server module and mobile application module. the microcontroller modules is consists of mainly four components are atmega328, ultrasonic sensor, GSM modem, GPS receiver .The use of the ultrasonic sensor is to detect the road surface and the distance between the vehicle and the data is received by the microcontroller .Where the threshold distance between the road surface and the vehicle body parts of the surface.

- The ultrasonic sensor which is to measure greater than the threshold distance to find whether the road has potholes or humps or in good conditions.
- The GPS receiver which captures the location of the detected potholes and humps then sends the information by message to the mobile SIM using the GSM modem.
- The server module consists of two parts, the android device and the database .The module is implemented as an android application that runs on the device and it send the message to the mobile SIM.

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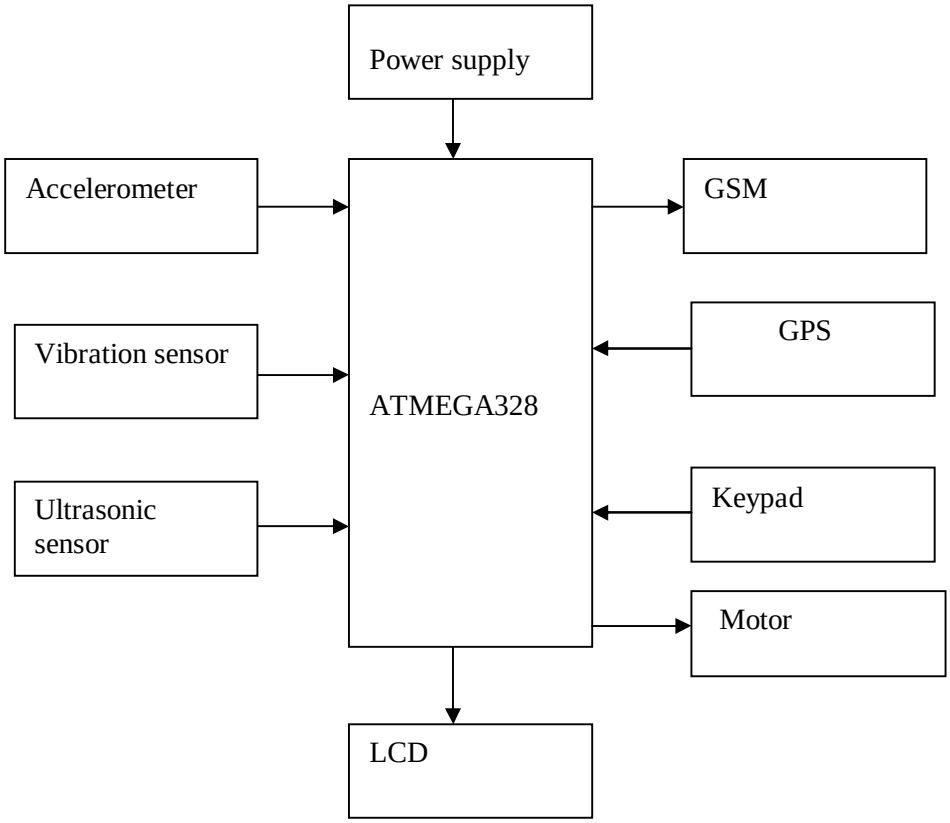
- Mobile application module is implemented as the application where vehicle drivers mobile phone to provide the time alert about the detection of potholes and hump, if the distance between the two is within 100 meters, an alert message to the mobile screen or else the audio beep can differentiate from other flash messages.



III.CIRCUIT DIAGRAM

In this circuit diagram, the connections are based on the proteus software. Mainly transformer is used in this, we are using step down transformer where to control the microcontroller pins. Whereas each componenthave various ranges all varies from different ranges. The accelerometer which is used to control the speed of the vehicles on the road by automatic. The liquid crystal display (LCD) which is used to display the output of the alert messages through the devices.

Here we have used Ultrasonic sensor, Vibration sensor, GSM, GPS, Accelerometer, transformer and microcontroller

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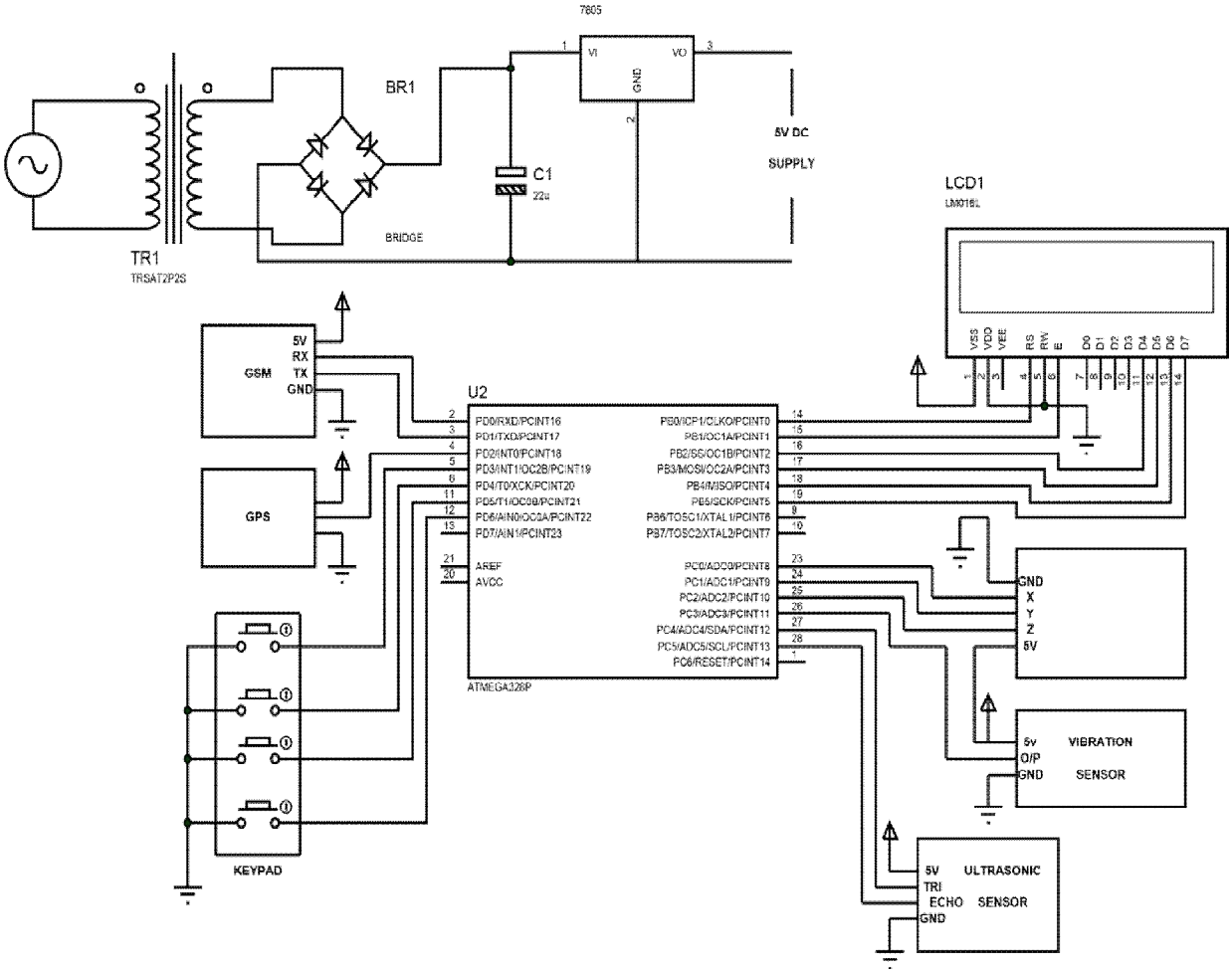

IV.COMPONENTS USED IN THE SYSTEM

The system which offers the cost effective for the detection of the potholes and humps which notifying drivers about their presence, the components used in the system are

- Atmega328 microcontroller :It is 40 pin microcontroller with 8k program memory.Microcontroller is the main part of the system which is responsible for various task processing from the sensor inputs to alert the drivers.

- Ultrasonic sensor HC-SR04: The active ultrasonic sensor is used to transmits and receives the signal. The distance is calculated is based on the object travels through the roads. Where the sensor works at frequency of40 kHz that use to measure the distance ranges from 2 to 400 cm.

- GPS Receiver: Global Positioning Systemis a satellite navigation system which is use to capture the location and time irrespective of the conditions, the GPS information format from the NMEA (National Marine Electronic Association).

- GSM SIM 900: Global standards for mobile communication for standards second generation .SIM which is used to communication over the telecommunication network. The modem which we are using to receive the alert text message and also which can make the voice call is a quad band modem.

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Microcontroller ATMEGA328

GSM SIM 900

LCD

V.RESULT AND CONCLUSION

The working of the experiment is done with the real time applications .And it was almost tested with the artificial potholes and humps by fixing the experiment in the bike and car and the first test was taken to record and stored in the data base, the second test was taken to find the alerts were generated based on the humps and potholes in the road by the detection of ultrasonic sensor. The mobile application is the advance technology used additional to this system were it provides the alert to the drivers while driving the vehicle .Where the solution of the experiment is that to mainly avoid the accidents on the roads and to control the speed of the vehicle is the main aim of the paper .

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