

# DETECTION AND NOTIFICATION OF POTHOLES AND HUMPS ON ROADS TO ASSIST DRIVERS

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**Abstract:** *In our country, road condition plays very important role. They carry almost country's passenger traffic and good. Many factors are responsible for accidents that are potholes and humps. So, detection of potholes and humps on roads is important. The sensor is used to detect the depth of potholes and height of humps. Global positioning system receiver is used to find position coordinates of potholes and humps. The database consist sensor data and geographic location of potholes and humps. This database is helps to assist drivers to avoid accidents. The system gives alert in the form of audio sound with the help of android application. This database is useful in rainy also. So that proposed system can be avoid accident and save many lives.*

**Keywords:** *PIC microcontroller, Sensor, GSM, GPS and android application*

## I. INTRODUCTION

In India, roads are important for transportation purpose. They carry freight as well as country's passenger traffic. Road condition is major reason to happen accidents in today's life. Potholes formed due to heavy reason as well as movement of vehicles. Hump on roads are different due to size and height. These parameters are responsible for accidents. In 2015 many people killed due to potholes and speed breakers. So, detection of potholes and humps on roads are necessary.

It is require to design and develop a system which is use to decrease the accident cases. So it is important to develop a system. To overcome this

problem the proposed system is help to peoples to avoid accidents. The system collects data of potholes and humps by using sensor. The sensor finds the depth and height of the pothole and humps. The location of potholes and humps find by using global positioning system. This data is store in database that is nothing but server. This information gives to driver in the form of message with audio sound.

The android application is used to generate alert for user. The solution is useful to save lives and it avoids accidents.

## II. RELATED WORK

This section consists of introduction of existing methodologies used for detecting humps and potholes.

Moazzam et al. [3] have designed a system for detecting potholes using kinect sensor. The images are collected from roads. Area of potholes is analyzed using depth information.

GuangtaoXue et al. [1] have proposed a scheme, called P3, which uses smart phones placed in vehicles to estimate the profiles of potholes on roads. A vibration model is designed to infer the depth and length of pothole while the vehicle is hitting the pothole.

SenthanMathavan et al. [4] have proposed 3D imaging technologies for detection and measurements. Stereo imagings, depth from focus, shapes from shading, photometric stereo are some of

the imaging technologies that can be used for pavement detection and measurement. It also proposes a procedure by considering the intrinsic

Sudarshan et al. [2] have proposed a Wi-Fi based system for detection of pothole and it also having driver warning system to avoiding potholes. It gives the driver prior warning. It consists of two function components, access points and Wi-Fi equipped mobile nodes.

### III. Proposed System

The block diagram of proposed system as shown in figure 1. It consists of ultrasonic sensor, GSM, GPS and PIC microcontroller. The system is divided into three main parts, one is microcontroller module, second one is server module and third is mobile application module. The PIC microcontroller is heart of the system.

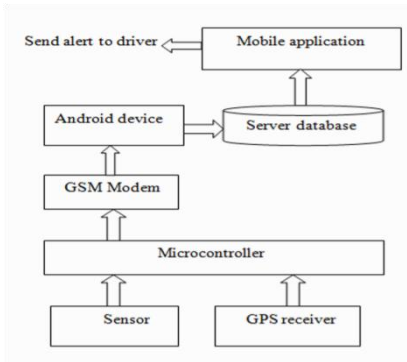


Figure 1: Block diagram of the proposed system

**Ultrasonic Sensor:** The ultrasonic sensor (HCSR04) is used to find depth and height of the potholes and humps respectively. This sensor gives accurate results in short period of time. This is suitable and easy to use. The sensor module consist transmitter and receiver. The trigger is input and echo is output. It gives accurate distance.

**PIC Microcontroller:** The PIC16F877a controller is heart of the system. It is widely used and high application support It is convenient to use. It consist 40 pins. It has flash memory technology so that write-erase many times. It handles very easily. The programming will be done in MPLAB IDE. The main objective of the system is detect and notify the potholes and humps on roads.

### IV. RESULTS

properties of imaging procedures and the dimensional details.

The Interfacing PIC16F877A to LCD on Proteus Software is done it is shown in figure 2. The data displayed on Liquid crystal display (LCD).

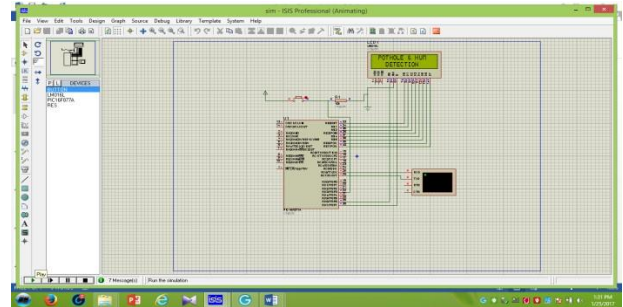


Figure 2: Simulation in Proteus software

Experimental hardware setup is shown in figure 3. Ultrasonic sensor is used to find the distance of potholes and humps. If the distance is less than 10cm then data is send to gps then it shows on getting gps data that is pothole detected. Programming is done on Mplab software. The data displayed on LCD display.

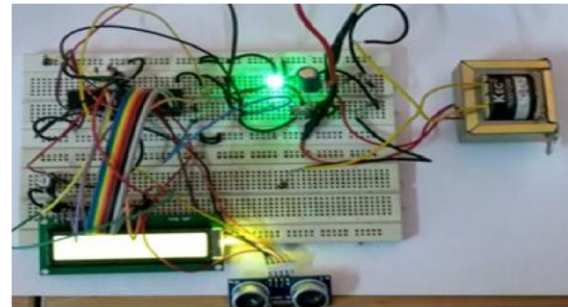


Figure 3: Hardware setup

### V. CONCLUSION AND FUTURE WORK

The system to detect and notify the presence of potholes and humps on roads to assist driver system is designed. Interfacing of sensor to PIC microcontroller is done and results are displayed on LCD. The design is built on Proteus software.

Future works will development of hardware setup with GSM and GPS receiver. The android application will develop to generate alert to assist drivers. The system can saves many lives and avoid accidents.

## **VI. REFERENCES**

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