**Development and Analysis of Pothole detection and Alert based on NodeMCU**

**Aim:**

The aim of this project is to detect pothole in the road and create the database. This record of potholes will help the road maintenance department to locate these bad roads. This can help to make maintenance work faster.

**Abstract:**

One of the major problems in developing countries is maintenance of roads. Well maintained roads contribute a major portion to the country’s economy. Identiﬁcation of pave-ment distress such as potholes and humps not only helps drivers to avoid accidents or vehicle damages, but also helps authorities to maintain roads. This paper discusses previous pothole detection methods that have been developed and proposes a cost-effective solution to identify the potholes and humps on the roads and provide timely alerts to drivers to avoid accidents or vehicle damages.Ultrasonic sensors are used to identify the potholes and humps and also to measure their depth and height, respectively. The proposed system captures the geographical location coordinates of the potholes and humps using a global positioning system receiver. The sensed-data include pothole depth, height of the hump, and geographic location, which is stored in the database (cloud).This serves as a valuable source of information to the government authorities and vehicle drivers.

**Existing system:**

In this existing system consists of an Ultrasonic sensor, it senses the distance between the vehicle and the pothole. The sensor provides the distance values to the PIC microcontroller. Based on the distance, an indication is provided to the driver. The indication is provided using a voice signal emitted by a speaker. The Voice IC attached to the controller exerts the stored voice signal. An indication is also provided using the LCD display.

**Proposed System:**

This system will make an online record of all the locations of potholes which were coming in the way of the vehicle having this system. This record of potholes will help the road maintenance department to locate these bad roads. This can help to make maintenance work faster. In this System the driver of the vehicle will be able to avoid the pothole as he/she can get alert.

**Block diagram:**

Arduino mega

Power supply u

Ultrasonic sensor

GPS modem

ESP8266

cloud

C:\Program Files (x86)\Microsoft Office\MEDIA\CAGCAT10\j0292020.wmf

Robo setup

**Block diagram description:**

Above the block diagram contain Arduino mega, ESPO8266, GPS modem, motor drivers, DC motor, ultrasonic sensor and 12v battery. The ultrasonic sensor is used to find a pothole road way. If any pothole detected from ultrasonic sensor, controller will send the location of the way and the pothole density to the cloud. Motor driver is used to control the robot direction. Robot moving direction is controlled from the mobile app. GPs modem is connected to UART sport of the controller and also get current location of the road.

**Requirements:**

**Software Requirements:**

Language : c++

Compiler : Arduino IDE

OS : LINUX

**Hardware Requirements:**

* Arduino UNO
* ESP8266
* GPs modem
* Motor drivers
* DC motors
* Ultrasonic sensor
* LCD 16x2
* Power supply
* 12v(3Ahm) battery