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ROAD ACCIDENT PREVENTION SYSTEM

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Abstract - In many developing countries the maintenance of roads are the major problem. A country's economy also determined by the safe roads and the road conditions of the country. India, as a second populous country in the world, also a fast growing country.
There are huge network of roads. Even from Kashmir to Kanyakumari broad roads are the dominant means of transportation in India. This work discusses merits and demerits of previous pothole detection methods that have been developed and proposes a cost effective solution to identify potholes and humps on roads and provide timely alerts to drivers to avoid accidents or vehicle damages. Ultrasonic sensors are used to identify potholes and humps. They also measure their depth and height respectively.

Keywords:ArduinoUNO,Pothhole detection,Microcontroller,Serial Moniter

1.INTRODUCTION

This project is done for alerting the driver of the vehicle by a buzzer. We will be using ultrasonic sensors to detect pothole or hump.Here, we will make a prototype model which wil help the driver of the vehicle to avoid or reduce speed when the pothole or hump is in its proximity.
A pothole is defined as irregularities on the surface of the road. With the climate change such as heavy rain and other factors like cheap quality of material used.Humps, which are usually laid on the road to reduce the speed of the vehicles can also damage the vehicles if the driver is not attentive enough. The proposed system captures the geographical location coordinates of potholes and humps using GPS receiver. The sensed-data includes pothole depth, height of hump and geographic location, which is stored in the database(cloud). This serves as a valuable source of information to the Government authorities and to vehicle drivers. An android application is used to alert drivers so that precautionary measures can be taken to evade accidents. Alerts are given in the form of a flash messages with an audio beep and long beep alarm to the drivers.

2 LITERATURE SURVEY

1. Stepheena Joseph et al., (2017) demonstrates that, Dangerous road conditions may be the result of natural events, such as tropical rains and flooding, that make driving unsafe. Dangerous conditions can also arise from the poor physical condition of a road and its surroundings. It may cause road accidents. Also while driving in the night just the headlights might not be a sufficient assistance for driver. Unexpected hurdles on road may cause more accidents. Also because of bad road conditions, fuel consumption of the vehicle increases. causing wastage of precious fuel. This proposed system pothole and hump detection and vehicle speed control system to inform the driver about the pothole or hump and controlling the speed of the vehicle. This system uses ultrasonic sensor to sense the potholes and humps and which measure the height and depth of the potholes.

2. Gnanapriya et al., (2017) One of the major problems faced by developing countries is the maintenance of road condition. Road infrastructure for the society is very important because majority of road accidents takes place due to bad condition of road like potholes. Potholes are caused due to poor quality and badly maintained roads. The constant movement of the overweight vehicles like trucks is also responsible for these ill roads. These ill quality roads will cause severe damage to the vehicles in terms of tire and most important thing is the accidents which are

caused due to this. An optimal system should be developed to monitor the road condition and analyses for future work.

3. Sudarshan S Rode, Shonil Vijay, Prakhar Goyal, Purushottam Kulkarni, Kavi Arya [2] This paper proposes WiFi based architecture for Pothole Detection and Warning System. The system consists of access points placed on the roadsides for broadcasting data, which can be received byte Wi-Fi enabled vehicles as they enter. The mobile nodes can also broadcast their response as feedback.

2.1 OUTCOME OF LITERATURE SURVEY

Using the data's obtained more damaged area can be prioritized and damage control can be reduced.With the proposed system an attempt could be done to endorse drivers to ward off the accidents caused due to potholes and raised humps.

3 PROBLEM STATEMENT

This problem has not been totally addressed in India as it is a huge nation with pretty a sizable population. Potholes, speed breakers, mud pits, grains, garbage and shards of glass are just a number of the things that may be found on the road while driving in India.Roads in India normally have speed breakers so that the vehicle's speed can be controlled to avoid accidents. However, these speed breakers are unevenly distributed with uneven and unscientific heights.Potholes, formed due to heavy rains and movement of heavy vehicles, also become a major reason for traumatic accidents and loss of human lives.

4 OBJECTIVE

Implementation of Vehicle speed reducing systems at speed breaks and avoidance of accidents using ultrasonic sensors.With the proposed system an attempt has been made to endorse drivers.Also to ward off the accidents caused due to potholes and raised humps.

5 METHODOLOGY

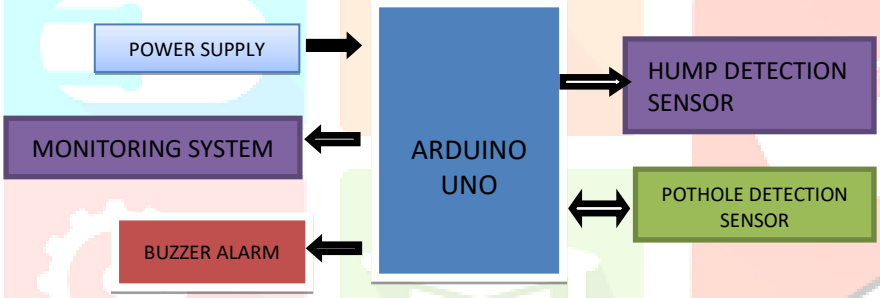

Figure a- Block diagram

The figure a represents the working of the Road accident prevention system. The Ultrasonic sensors is used to measure the distance of Hump and Potholes and Arduino Uno acts as control unit which controls sensor calculates the distance and activates the buzzer. Initially, ultrasonic sensor transmits acoustic pulses and receives the reflected pulses, Arduino makes use of the time interval of the reflected pulses and calculates the distance between the hump and sensors, microcontroller will activate the buzzer and if the distance is less than 20 cms the buzzer activates. The measured distance is continuously displayed on the Monitoring system. The ultrasonic sensor consists of 4 pins: VCC, TRIG, ECHO and GND. VCC, GND are in connection with +5V and GND of the power supply while the TRIG and ECHO are connected to Digital I/O pins of Arduino respectively. Buzzer of 5V is used .

5.1 HARDWARE REQUIREMENT:

The following project consists of the following parts:

1. Arduino Uno
2. Ultrasonic sensor
3. Serial Monitor
4. Buzzer

5.2 SOFTWARE REQUIREMENT:

The following project consists of the software's:

1 Arduino ide

7 RESULTS AND DISCUSSIONS

The proposed approach is an economic solution for detection of dreadful potholes and uneven humps, as it uses low cost ultrasonic sensors. The buzzer alarm used in this system is an additional advantage as it provides timely alerts about potholes and humps. The solution also works in rainy season when potholes are filled with muddy water as alerts are generated using the detection of ultrasonic sensor. We feel that the solution provided in this paper can save many lives and ailing patients who suffer from tragic accidents**.**The proposed system considers the presence of potholes and humps. However, it does not consider the fact that potholes or humps get repaired by concerned authorities periodically. This system can be further improved to consider the above fact and update server database accordingly**.**

7.1 Advantages:

- Initial cost is low.3
- It is more economical
- Increases safety while driving and avoids accidents.
- It is more accurate as it indicates the exact distance between the vehicle and obstacles.

7.2 Disadvantages:

- Very sensitive to extreme environmental changes.
- To sense accurately ultrasonic sensors are need to placed on the bumpers of car, which need to be drilled into bumper which ruins the appearance of car.

7.3 Applications:

- Obstacle moving robots
- Distance measurement

8 CONCLUSION:

In this project ultrasonic sensor is used, which will sense any obstacle in its desired range, with the help of arduino controller. Arduino controller is used control the ultrasonic sensor through our preinstalled program, we also use Serial monitor to display the distance for more accuracy in our vehicle, buzzers are used for indication of any obstacles which lie under its range.

8.1 FUTURE SCOPE

- Making it available for all types of vehicle.
- Using several sensor to get proper reading while driving car.
- Automatic breaking system.
- Can be implemented accident alert system using GSM.

REFERENCES

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