ISSN2394-3777 (Print)
ISSN2394-3785 (Online)
Available online atwww.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 5, Special Issue 9, March 2018

Intelligent Transport System And Traffic Management Using Vibration Sensor

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ABSTRACT

Pothole Detection System investigates an application of mobile detecting and reporting the surface conditions of roads. We describe a system and associated algorithms to monitor this important civil infrastructure using a collection of sensor-equipped vehicles. This system, which uses the inherent mobility of the participating vehicles, gathering data from vibration, ultrasonic and GPS sensors, and processing the data to assess road surface conditions. we have been able to build a detector that misidentifies good road segments as having potholes less than 0.2% of the time. It has a most effective system for vehicle by comparing exiting system using path hole detector. Driving the vehicle on the road having bad condition is very dangerous to the driver. Due to rains, oil –spills quality of the road decreases. Such hurdles may cause road accidents. To overcome such problem we proposed this system 'Intelligent Pothole Detection and Notification System'. In this system ultrasonic sensor and vibration sensor is used to sense the pothole. Image of such location is captured using WEBCAM. The GPS system finds the position of pothole. All the data is saved in the database. This collected information of bad condition roads is helpful for recovery of the road. This system not only indicates but also sends the information to the government and the maintenance is done on the rood by the help of ITS (Intelligent Transportation System) .

1. INTRODUCTION

This paper investigates an application of path hole detecting and reporting the surface conditions of roads. Municipalities around the world spend millions of dollars to maintain and repair their roadways. Despite this investment, few people are happy with the quality of the roads where they live or work. The reason is that bad roads damage vehicles, are sometimes hazardous to drivers and pedestrians, and, at the very least, are annoying to drive or bike on. Potholes refer to any type of road surface distress on an asphalt pavement that is more than 150 mm in diameter. Potholes are induced by the combined presence of water in the asphalt soil structure and heavy traffic. Potholes are mostly generated in winter and spring, because water often penetrates the pavement during these seasons. Warnings can be like buzzer if the driver is approaching a pothole, or driver may be warned in advanced regarding what road has how many potholes.

Fig 1.potholes on road

Keeping our roadways in good condition is a challenging problem because harsh weather, unexpected traffic load, and normal wear and tear all degrade even well-laid roads over relatively shortperiods of time (weeks to months). Citizens are feed up of the long Queues of Municipal Corporation for their mere complaints regarding potholes on road and highways. Road Accidents are increasing now

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days because of bad condition of roads everywhere. Contractors who take up road and highway contracts and maintenances contract does not do their task as stated in the tenders they file, so to have foolproof evidence and also to make them notice of their work done on roads.

2. Control and Automation

In a connected world, a business will have visibility into a device's condition. In many cases, a business or consumer will also be able to remotely control a device. For example, a business can remotely turn on or shut down a specific piece of equipment or adjust the temperature in a climate-controlled environment. Meanwhile, a consumer can use IoT to unlock their car or start the washing machine. Once a performance baseline has been established, a process can send alerts for anomalies and possibly deliver an automated response. For example, if the brake pads on a truck are about to fail, it can prompt the company to take the vehicle out of service and automatically schedule maintenance.

3. BLOCK DIAGRAM

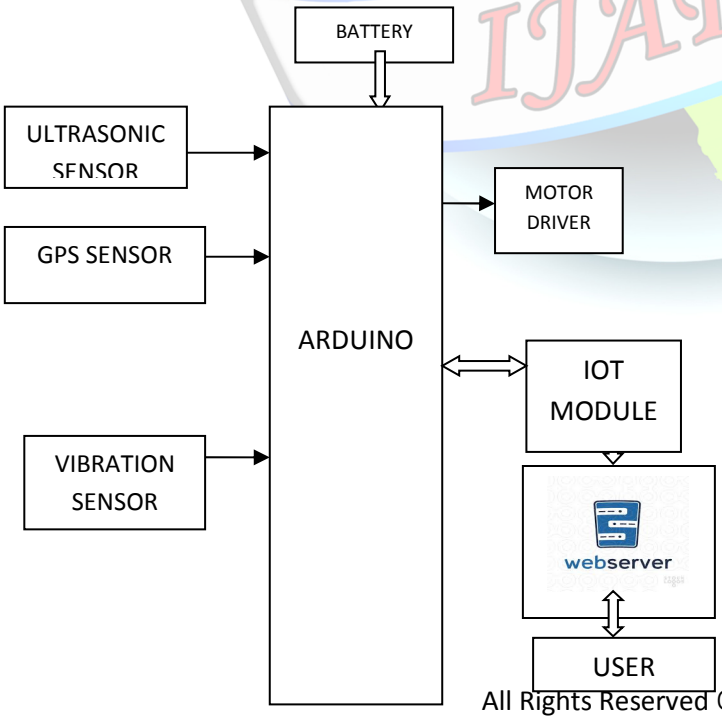

Fig 2. Block diagram

4. EXISTING SYSTEM

- Citizens are feed up of the long queues of Municipal Corporation for their mere complaints regarding potholes on road and highways.
- Pothole detection system using image processing system.
- The Pothole Patrol: Using a Mobile Sensor Network for Road Surface Monitoring.
- Pothole Tracking System using Android Smart Phone.

5. HARDWARE USED

- Arduino uno microcontroller (ATmega328)
- Ultrasonic sensor
- Vibration sensor
- GSM
- Lcd display

6. SOFTWARE DESCRIPTION

- **Embedded C**

An embedded system is an application that contains at least one programmable computer (typically in the form of a microcontroller, a microprocessor or digital signal processor chip) and which is used by individuals who are, in the main, unaware that the system is computer-based. Looking around, we find ourselves to be surrounded by various types of embedded systems. Be it a digital camera or a mobile phone or a washing machine, all of them has some kind of processor functioning inside it.

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Associated with each processor is the embedded software. If hardware forms the body of an embedded system, embedded processor acts as the brain, and embedded software forms its soul. It is the embedded software which primarily governs the functioning of embedded systems.

- **EMBEDDED SYSTEMS PROGRAMMING**

Embedded systems programming is different from developing applications on a desktop computers. Key characteristics of an embedded system, when compared to PCs, are as follows. Embedded devices have resource constraints(limited ROM, limited RAM, limited stack space, less processing power) Components used in embedded system and PCs are different; embedded systems typically uses smaller, less power consuming components. Embedded systems are more tied to the hardware.

ARDUINO SOFTWARE (IDE)

The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino and Genuino hardware to upload programs and communicate with them Programs written using Arduino Software (IDE) are called **sketches**. These sketches are written in the text editor and are saved with the file extension .ino. The editor has features for cutting/pasting and for searching/replacing text. The message area gives feedback while saving and exporting and also displays errors. The console displays text output by the Arduino Software (IDE), including complete error messages and other information. The bottom righthand corner of the window displays the configured board and serial port. The toolbar buttons allow you to verify and upload programs, create, open, and save sketches, and open the serial monitor.

a) DIFFERENCE BETWEEN C AND EMBEDDED C:

Though C and embedded C appear different and are used in different contexts, they have more similarities than the differences. Most of the constructs are same; the difference lies in their applications. C is used for desktop computers, while embedded C is for microcontroller based applications. Accordingly, C has the luxury to use resources of a desktop PC like memory, OS, etc. While programming on desktop systems, we need not bother about memory. However, embedded C has to use with the limited resources (RAM, ROM, I/Os) on an embedded processor. Thus, program code must fit into the available program memory. If code exceeds the limit, the system is likely to crash.

7. CONCLUSION

In this paper, we have proposed system which will detect the potholes on the road and save the information in the server. Due to the rains and oil spills potholes are generated which will cause the accidents. The potholes are detected and its height, depth and size are measured using ultrasonic sensor. The GPS is used to find the location of pothole. All the information is saved in the database. This timely information can help to recover the road as fast as possible. Hence the system will help to avoid road accidents. This paper studied an application of mobile sensing: detecting and reporting the surface conditions of roads. We described the system and associated algorithms to monitor this important civil infrastructure using a collection of sensor-equipped vehicles. Uses the inherent mobility of the participating vehicles, opportunistically gathering data from vibration and GPS sensors, and processing the data to assess road surface conditions. We also evaluated our system on data from thousands of kilometers of “uncontrolled” taxi drives, and found that out of reported detections, over 90% contain road anomalies in need of repair.

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