

# **SUMMER PROJECT**

201351021@iiitvadodara.ac.in

Manu Sharma

201351021

3-6 june,2k15

## **Mobile based Early Warning System for Drivers**

## Contents

<b>1</b>	<b>Work done so far in the same field.</b>	<b>3</b>
1.1	System Proposed by International Journal of Engineering Trends and Technology . . . . .	3
1.2	System proposed by International Journal of Emerging Tech- nology and Advanced Engine . . . . .	4
1.3	Speed breaker early warning system . . . . .	6
<b>2</b>	<b>Stopping distance of vehicle in different conditions</b>	<b>7</b>
<b>3</b>	<b>Scope of our project</b>	<b>7</b>
<b>4</b>	<b>Our plans</b>	<b>8</b>
<b>5</b>	<b>Future work</b>	<b>8</b>
<b>6</b>	<b>References</b>	<b>8</b>

# **1 Work done so far in the same field.**

## **1.1 System Proposed by International Journal of Engineering Trends and Technology**

### **Title**

Safe driving using android based devices

### **Abstract**

In the present world we all do see the rise in road accidents and also experience that very few measures are taken such accidents before they occur. Mobile phones especially smart phones are equipped with the efficient sensors and other features that can together form a portable device to monitor road conditions.

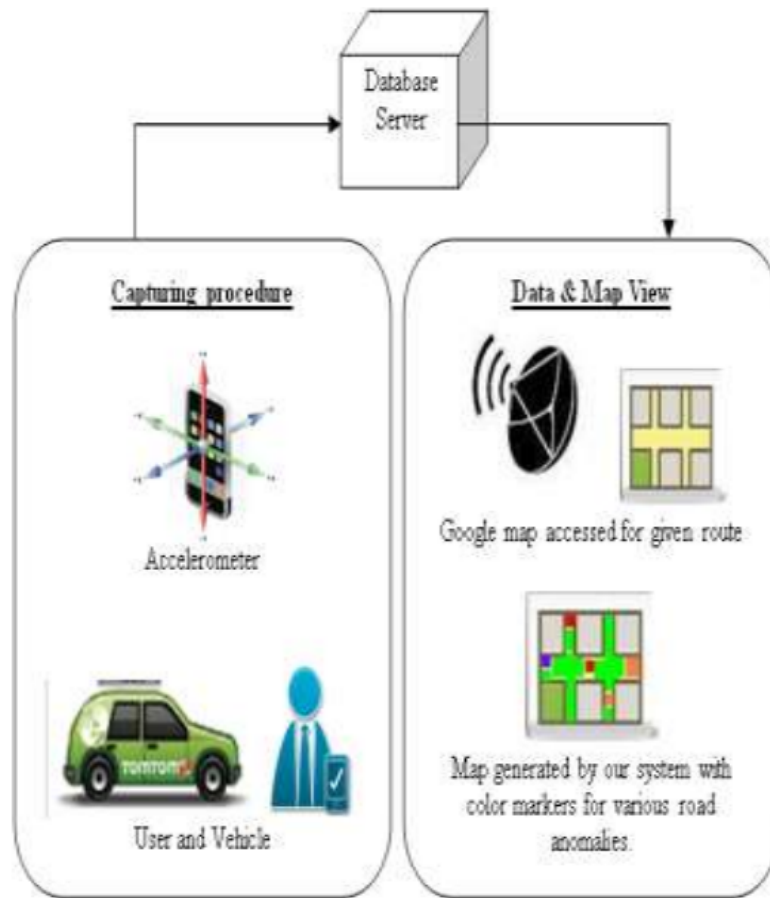
### **Keywords**

Android, road safety, accelerometer, road anomalies.

**Overview** Proposed system requires a dedicated sensors to be present on smart phone. If any movement is detected it is numerically analyzed can be shown in specific direction with the help of embedded accelerometer. Here difference between pothole or bump or any such comparison of the different road anomalies is possible by setting the specific threshold values for each accelerometer axis.

GPS is used to extract the location. Device should have Wi-Fi so that it is possible to connect it to the server.

They make use of color code technique which is assigned to certain interpolated values for segment. For example Red color can be used to represent bumps, blue color to represent pothole, smooth road can be shown by green color and so on.



### Future work

In future they plan to extend their work to auditory alerts of these factors.

## 1.2 System proposed by International Journal of Emerging Technology and Advanced Engine

### Title

Pothole Detection System using Machine Learning on Android

### Abstract

This system investigates an application of mobile sensing: detection of potholes on roads. We describe a system and an associated algorithm to monitor the pothole conditions on the road. This system, that we call the Pothole Detection System, uses Accelerometer Sensor of Android smart phone for detection of potholes and GPS for plotting the location of potholes on Google Maps. Using a simple machine-learning approach, we show that we are able to identify the potholes from accelerometer data.

## **Keywords**

Machine learning,context,android,neural networks,pothole,sensors.

## **Introduction**

Android, owned by Google, has become the most widespread mobile operating system in use today. The availability of an intuitive IDE like Eclipse along with a robust SDK that is updated regularly, Android certainly does not lack any charm for eager developers- amateurs and seasoned professionals alike. Context aware services separate the present from the past. Intelligent programs making use of data acquired from a host of sensors like GPS chip, Accelerometer, Gyroscope etc. have made life a lot easier. They are ubiquitous in the modern day, from location services to games. In this paper, we aim to evaluate a Pothole Detection System, developed by us which involve processing sensor readings and judging the accuracy of the system using a neural network. The following sections provide sufficient background and insight into our aim to develop a system that detects potholes, logs their location and creates a document in a distributable format that can be utilized to upload to a centralized server or sent to concerned authorities immediately.

## **Overview**

This system detects the pothole with the help of accelerometer. The pothole sensor plug-in monitors the changes in the acceleration in order to detect potholes. Further the storage of pothole location on the data base is done. This system also deploys a neural network to implement Machine Learning on Android, and to improve the efficiency and accuracy of the detection of potholes. An Artificial Neural Network (ANN) is an information processing paradigm that is inspired by the way biological nervous systems, such as the brain, process information. It is composed of a large number of highly interconnected processing elements (neurons) working in unison to solve specific problems.

## **Conclusion and Future Work**

The Pothole Detection System is an attempt to provide its users with better knowledge about the routes of their transportation. Despite hardware differences in terms of GPS accuracy, accelerometer sampling rate and noise, we postulate that accurate pothole detection is possible. We believe that our experience will help to improve efficiency and reduce time and effort for further experiments using the Android platform for vehicular sensing

researchers. With further work in this field, it is possible for this project to play a proactive part in improving road conditions in developing countries.

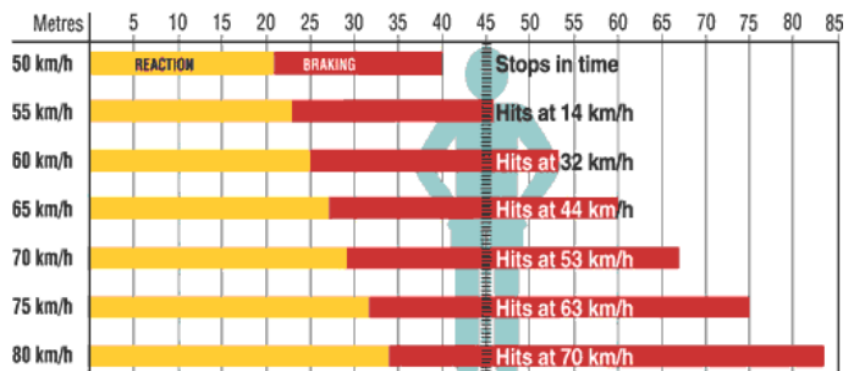
### **1.3 Speed breaker early warning system**

This system also detects the speed breakers and potholes on the roads and make the user aware with these road anomalies. This system again uses the android based smart phone and accelerometer to achieve its aim.

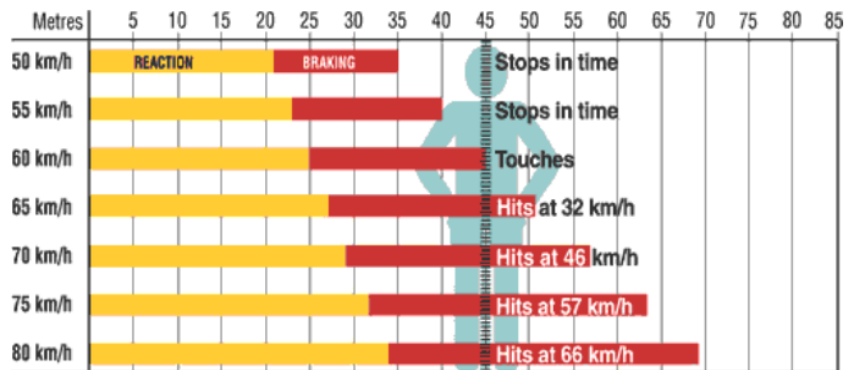
## 2 Stopping distance of vehicle in different conditions

Given below is the record of the survey which tells us about the distance traveled by vehicle before stopping in different conditions. This data can help us to tell the safe speed in different conditions.

**Stopping distance in Wet conditions**



**Stopping Distance in dry conditions**



## 3 Scope of our project

The aim of our project is to create an advanced driving assistance system for two and four wheeler vehicles. We hope to create a tracker which generates an alarm each time the vehicle goes off the road. Also by the virtue of facial recognition , we can capture the eyes of the driver over time to alert him whenever he tends to near falling asleep. The work done in this field revolves largely around four wheelers. Here we aim to bring it down to the level of

two wheelers too. With the help of the image detection, we are hopeful that obstructions may also be detected on the road which will prevent or avoid accidents.

## 4 Our plans

We will include emergency alert in the system we build. This system will be responsible of informing the authorities and the relatives of the casualties. As mentioned earlier, an off road tracker, obstruction detection and building the system around two wheelers will hold the key to our project. The accelerometer will help us recognize potholes, speed breakers etc on the road and we will be alerted about the same hopefully when we are traveling from the same route again. The analysis of the readings will produce a maximum speed limit per given condition. The system will keep in account of the time of the day (nights tend to be more accident prone) and the weather (rainy, snowy etc). This way according to different situations the system will produce appropriate speed warnings and alarms. There will also be a notification to remind the driver about the seat belts whenever he starts to drive. All the functions will only work after reaching a threshold value of speed.

## 5 Future work

The obstruction detection system could further be modified into an overtaking warning system. Moreover we can try to judge the driving capacity of the driver if he has consumed some alcohol. Further we can extend this system to a system which will make the driver aware with the safe speed in different conditions.

## 6 References

1. <http://www.ijettjournal.org/volume-18/number-3/IJETT-V18P229.pdf>
2. <https://www.iiitd.edu.in/skkaul/Papers/nsdr12-final11.pdf>
3. [www.roadsafetymayo.ie](http://www.roadsafetymayo.ie)
4. Real time pothole detection using Android smartphones with accelerometers," A. Mednis, G. Strazdins, R. Zviedris, G. Kanonirs, L. Selavo, dcoss, pp.1-6, 2011 International Conference on Distributed Computing in Sensor Systems and Workshops (2011)
5. [http://www.ijetae.com/files/Volume4Issue7/IJETAE\\_0714\\_55.pdf](http://www.ijetae.com/files/Volume4Issue7/IJETAE_0714_55.pdf)