

FEEDVIEW - An Analytic Multi-Platform Application

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Abstract: *A feedback oriented multi-platform application designed to create a survey for road transport. A simple way to provide a feedback/report for the concern department. Road development department no longer need to do physical surveys with the data collected from multiple user's they can directly take required actions. Car owner no longer need to contact in person or online or by walk-in, he/she can just share the details with just one click. FEEDVIEW is a multi-platform application which can work on any platform like Android, IOS, Windows and Linux. It basically uses the sensors built in the phone to take the readings and give the precise location of potholes and the bumps which a user encounter in their journey from a source to destination. This app is basically built-in flutter which is a recent emerging language in which when we code in a single language and this code becomes compatible with all the languages. Distinguishing between different types of physical activities using sensor data has been a recent research topic that has received considerable attention.*

Keywords: - Multi-platform, Application, Data, Survey, Sensor Data, Flutter, Android, Windows, IOS

I. INTRODUCTION

Nowadays, learning new technologies is known a big success in various fields. As it opens new doors and thinking that can change the world and make living easy so we are developing an app in Flutter which is a cross platform framework which can be accessed from Android, IOS and Windows. Basically, Flutter builds, tests, and deploy beautiful mobile, Desktop and Embedded apps from a single codebase.

II. MOTIVATION

The main aim of this project work is to create an application that can track sensor activity to further process and analysis and process and then display by creating a report for respective sources. Every sensor is perfecting designed to obtain the most optimistic reading and provide with most accurate reading and these reading when processed in large no and give a perfect opinion/Answer to whatever the question/problem arises. A simple way to provide a feedback/report for the concern department. Car owner no longer need to contact in person or online or by walk-in, he/she can just share the details with just one click.

III. PROBLEM DEFINITION

As of now there is no such tool or way to report issues with the government bodies which can fix issues on highway with having a physical presence at every certain spot, by using this tool road development department can directly determine which road is having pits, traffic issue, and other issue, by obtaining user data and processing this data to get exact details to fix issue

Case1: -

This is the tool or way to report issues with the government bodies which can fix issues on highway without having a physical presence at every certain spot, by using this tool road development department can directly determine which road is having pits, traffic issue and other issues, by obtaining user data and processing this data to get exact details to fix issue.

Case 2: -

As we know that in India some people before travelling check the google maps satellite view to check the conditions of roads but as we know that the images are so blur this is because of security reasons of the defence. The permissible resolution as per the law for private and general-purpose use is 1 meter special.



Figure 1: Satellite Image from Google Maps

IV. OBJECTIVE

The objective of the project is that we have a multi sensors gadget that we use in our day today life i.e. our smartphone as we know that our smartphone have many sensors like accelerometer, light sensor, gyroscope, barometer, motion detector etc. we got an idea that what if we can use our smartphone as a tool to test the condition of the road or to find where there is more traffic .We can all do this by taking the data that sensors collected and then finding the exact longitude and latitude of the pothole and bumps on roads. The main aim of this project work is to create an application that can locate each pothole and bumps in a road trip. Every sensor is perfecting designed to obtain the most optimistic reading and provide with most accurate reading and these reading when processed in large no and give a perfect opinion/Answer to whatever the question/problem arises. The smartphones have multiple built-in sensors each having a specific function which helps the device perform efficiently. These sensors can potentially be used to detect events or gather data about human activities.

V. PROJECT SCOPE

The main scope of this project is to determine exact position (longitude and latitude) of potholes and bumps on roads and then send the collected data to respective road departments. This system key or highlighting features would be, to location of the potholes and bumps in real time when you are driving your car from a source to destination. This system is built to be able to update in future. Some of future updates of this system are,

- Mapping exact locations of potholes on map.
- Mapping exact location of bumps on maps.
- Determining the condition of road to user on their particular journey

VI. LITERATURE REVIEW

Year: - Feb 2018

Topic: - Activity Detection and Analysis Using Smartphone Sensors

Author: - Amari Vaughn, Paul Biocco, Yang Liu, Mohd Anwar North Carolina A&T State University, (IEEE International Conference on Information Reuse and Integration for Data Science)

The use of machine learning algorithms on smartphone sensor data could have numerous applications in finance, healthcare, entertainment, etc. In this research, we develop mechanisms to gather sensor data and study how the data can be used to differentiate patterns in user physical motions. In this research, multiple behaviours were distinguished using sensor data. For our experiments, we focus on three classes of human activity which are walking, standing, and running.

Included in our data is the sensor input while the device is sitting in a stationary position. To detect the device motion, our experiments will use the smartphone accelerometer and gyroscope. From the data collected through an application, we create a feature set which consists of linear acceleration, normal acceleration and angular acceleration.

Year: -2021

Topic: - Smartphone-Based Real-Time Travel Mode Detection for Intelligent Transportation Systems

Author: - Elton F. de S. Soares, Carlos A. de M. S. Quintella, and Carlos Alberto V. Campos, Member, IEEE

Emotions Intelligent Transportation Systems include all transportation modes, aiming to improve the efficiency of transportation in many situations. Identifying the transportation mode of users is a key performance and quality requirement for ITS. Real-time detection could allow cost and latency reduction for ITS applications since all the processing can be made within smartphone devices and actions can be taken quicker, as the information will always be up to date. In this paper, we propose a real-time travel mode detection technique that applies supervised machine learning (ML) on location data extracted from smartphone sensors.

VII. ARCHITECTURE

This application needs to be installed on the device and kept running in background and task must be kept running while travelling. The need of application to solve this issue of reporting issues with proper detailed report is required today. Without facing the hassle to take onsite observation every time. We can all do this by taking the data that sensors collected and train a machine learning model that predicts whether the road is good or is the cars suspensions are good and many more things. our smartphone has many sensors like accelerometer, light sensor, gyroscope, barometer, motion detector etc. we got an idea that what if we can use our smartphone as a tool to test the condition of the road or to test the specifications of a car or to find where there is more traffic.

System architecture includes Login module, Dashboard, Settings, Take test, and Report module. The data obtained through accelerometer, GPS (for location) and Gyroscope through testing will be fetched through sensors and save to log file. It will be visualized by random forest algorithm. The data will be fetched back to user from server and results will be displayed in report. The report can be viewed and shared to car company and Road Safety Department (RSD).

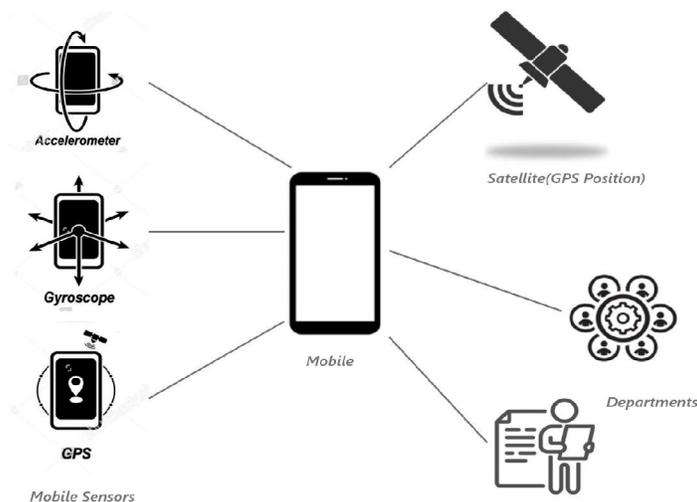


Figure 2: System Architecture

VIII. WHAT IS FEEDVIEW

A feedback oriented multiplatform application designed to create a survey for road transport and car safety. We have a multi sensors gadget that we use in our day today life i.e., our smartphone as we know that our smartphone has many sensors like accelerometer, light sensor, gyroscope, barometer, motion detector etc. we got an idea that what if we can use our smartphone as a tool to test the condition of the road or to test the specifications of a car or to find where there is more traffic.

This project is to determine exact position (longitude and latitude) of potholes and bumps on roads and then send the collected data to respective road departments.

IX. SMARTPHONE SENSORS

Convolutional The smartphones have multiple built-in sensors each having a specific function which helps the device perform efficiently. These sensors can potentially be used to detect events or gather data about human activities. The use of machine learning algorithms on smartphone sensor data could have numerous applications in finance, healthcare, entertainment, etc. In this research, we develop mechanisms to gather sensor data and study how the data can be used to differentiate patterns in user vehicle motions and thus detect the road conditions. We developed a smartphone application for the Android platform to gather data from a mobile device to detect the device motion, our experiments will use the smartphone accelerometer and gyroscope

X. SENSOR INFORMATION AND OUTPUT SPECIFICATION

When considering motion capture, the primary sensors we focused on were the accelerometer and the gyro meter. Usually, the accelerometer and gyro meter assist in tracking the phone's orientation, allowing the devices UI to adjust appropriately. To capture data from the accelerometer and gyro meter, we built a mobile application, which retrieves the data from a test smartphone device. The accelerometer measures the force of acceleration in a direction. The sensor provides a three-dimensional vector for the acceleration in m/s^2 along each axis of a device. Often it is used to determine the device's orientation, but can also potentially be used to indicate significant physical motions of the device user. At rest, the device's accelerometer will equal the gravitational force on the phone. To fully utilize the accelerometer, we retrieve the raw acceleration and the linear acceleration of the device excluding gravity by applying a low-pass filter.

We calculate the linear acceleration of a device in motion by subtracting the force of gravity from the device acceleration. The gyroscope, much like the accelerometer, provides a three-dimensional perspective on the device. However, instead of calculating acceleration, the gyro meter calculates the rate of rotation in rad/s . The gyroscope will give positive values when the device is turned clockwise and negative values when turned counter clockwise on any device axis. The gyroscope uses the same three vectors as the accelerometer which represent the angular acceleration on the X, Y and, Z axis of the device. The GPS detects the real time location of the device.

XI. ROAD SURFACE DETECTION

Road quality assessment plays a key role in infrastructure management and it is useful to an adequate allocation of road maintenance operations. At the same time, informing drivers on road real conditions, in terms of the presence of bumps, potholes, or other anomalies, has a great importance in order to make the transportation system more safe, efficient and comfortable. Furthermore, having information on infrastructure quality allows road managers to guarantee an adequate maintenance.

XII. APPLICATIONS

1. Road Development Corporation:

This application tool or way to report issues with the government bodies which can fix issues on highway with having a physical presence at every certain spot. By using this tool road development department can directly determine which road is having pits, bumps and other issue, by obtaining user data and processing this data to get exact details to fix issue.

2. Automobile Companies:

Using this system, automobile companies can also easily get the vehicle issues. The data can also be used to provide feedback for car companies that can analysis what is the most common issue faced by the users with their car models and then can on further testing these issues can be solved.

For e.g.: - Suspension Test in cars, mileage, vibration's, etc.

3. Normal Users:

The collected data and the generated report can also be useful for the normal users. When the user is using the particular route, he/she can check the condition of the that route if it is recorded and saved. So, the generated report provide help to the people travelling everyday while travelling to various locations.

XIII. SCREENSHOTS

These are the final results of the FeedView App where you can see the no pf potholes and bumps and also your live location.

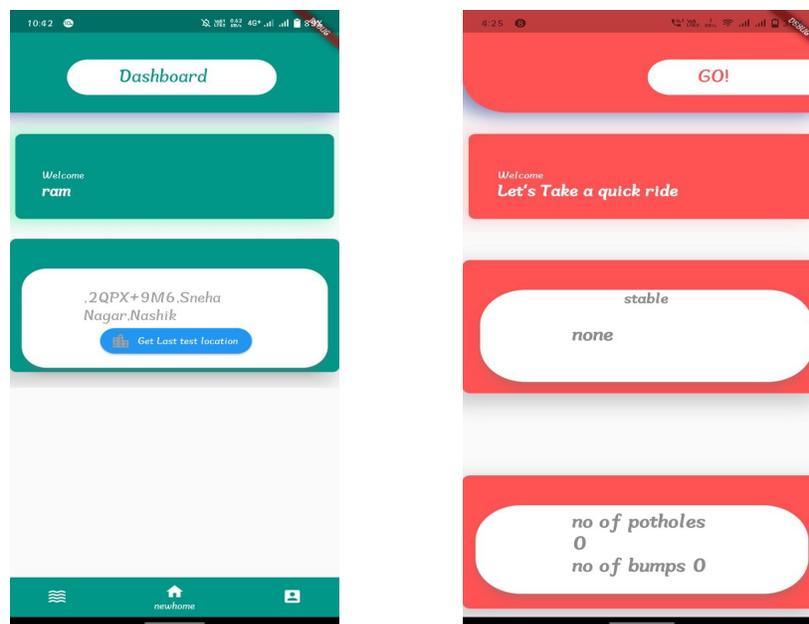


Figure 3: Screenshots of the App

XIV. FUTURE WORK

Upon conclusion of this work, we have found several future directions for this research. Using supervised learning, we could classify states of walking, running, and standing with an 89 percent accuracy rating. To potentially increase this accuracy, we intend to use our existing data and process it through a neural network. In addition, we intend to expand upon the numbers of activities we can detect. These events can assist in emergency event detection such as crash impacts, human injury, or drowning when the victim has their phone with them.

The System Features that we discussed are as follows,

- Sensor Data Collection
- Road Surface Detection
- Report Generation
- Result

XV. CONCLUSION

In this system, we have designed a feedback oriented multi-platform application designed to create a survey for road transport and car safety. A simple way to provide a feedback/report for the concern department It can track sensor activity to further process and analysis and process and then display by creating a report for respective sources. A user can create a report which can be collected from server and fetched to respected departments, which can help them process respective tasks easily without taking the hassle to review everyplace on site and also the car companies need not to test the car's several time when a lot of complaint's arrive to get the problem escalated and solved further. This is the most efficient way, hassle free. An application that can collect data and provide to efficient, accurate and proper results in the form of report, where we need not to have any sort of hardware or need any other permissions. It includes random forest algorithm ensemble learning method for classification, regression and other tasks that operates by constructing a multitude of decision trees at training time.

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