Utilizing the Emergence of Android Smartphones for Public Welfare by Providing Advance Accident Detection and Remedy by 108 Ambulances

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Abstract

As increasing road networks, road accidents are matter of concern; this application is designed to sense the accident using the sensors in the Android Smartphone. After sensing the accident, application automatically generates the geographical information by GPS and sends location information via pre-recorder voice message to 108 ambulance emergency response service.

Index Terms – 108, Ambulance, GPS, Road Accident, Emergency Service, Android Application.

Introduction

India is one of the most attractive mobile markets in the world. Recently Strategy Analytics claimed that India is now the 3rd largest Smartphone market after China and US (Based on Q1'13 data). As competition increases between manufacturers of Smart phones, dominating market of Smart phones providing extraordinary features and services to consumers apart from basic functionality in order to survive into the market.

Different categories of applications are being developed to meet the user's requirements. Each mobile user is of unique kind, one wants to use the basic functionality of the smart phones while another wants to develop his own application. In order to do so, GOOGLE introduced versatile open source operating system called "ANDROID". In 2005, Google acquired Android from Android Inc. which was founded by Andy Rubin, Rich Miner and Nick Sears in year 2003.

Later, OHA which comprises of 79 companies along with Google developed their new mobile platform for mobile device. Android works on Linux Kernel. Android announced its code as an open source in the year 2008. Android comes up with an API for mobile devices. Google provides a SDK to all developers which include libraries, debugger and a handset emulator in Eclipse IDE.

Problem Statement and Synopsis

To avoid accident, driving a vehicle has to be done with most care. The most obvious reason for a person's death during accidents is unavailability of the first aid provision which is due to the delay in the information of the accident being reached to the ambulance or to the hospital. Consider a case that the accident occurred while a person is traveling in a vehicle.

Now, question is how we can detect accident by use of Android Smartphone. Thanks to built in sensor of the Android Smartphone called "ACCELEROMETER". Accelerometer sensor would help to sense any slight movement of an Android Smartphone which is docked inside the car and not being held in hand or in pocket of the person who is driving the vehicle.

Designing

Our application is designed using the sensor accelerometer which will detect any tilt in the mobile device. At times this tilt might be just by mistake where the person might have pressed it accidentally. In such a situation the application will wait for 15sec for the user to enter send or press cancel. If the user doesn't press any key within that time, then the application considers the person to be in danger and sends an emergency pre-recorded voice message along with longitude & latitude to Emergency Response Service 108. The key assumption of this application is that the mobile phone should not be kept along with the person who is driving the vehicle; it must be on docked inside the vehicle.

Flowchart is given below for further understanding of this application.
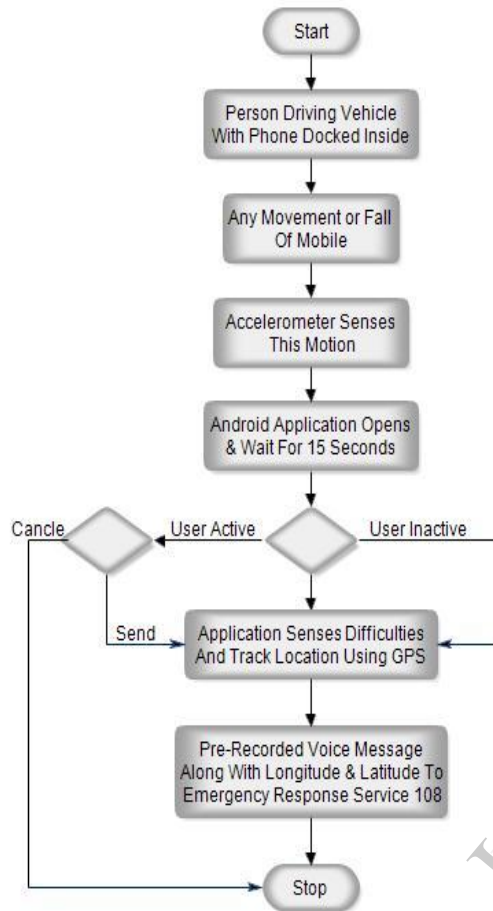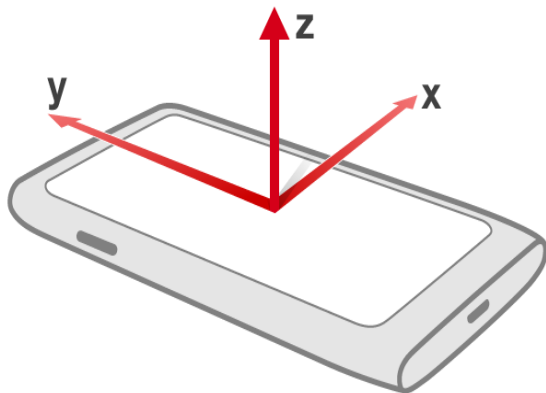
Flowchart

Figure 1. Accident Scenario

Figure 2. Mobile Movement

Implementation

Accidents, which will be sensed by the mobile using a specialized sensor called as accelerometer which is present inside android mobiles. The sensors of these type cadences the acceleration applied to the device. Reckons the device's orientation grounded as shown in Figure 2 on the rotation matrix.

SensorManager is a public class which lets us to access the device's sensors. Below snippet is the class overview of initializing and activating the accelerometer sensor.

```
public class SensorActivity extends Activity,
implements SensorEventListener
{
private final SensorManager mSensorManager;
private final Sensor mAccelerometer;
public SensorActivity()
 {
mSensorManager
=(SensorManager)getSystemService(SENSOR_SER
VICE);
mAccelerometer =
mSensorManager.getDefaultSensor(Sensor.TYPE_
ACCELEROMETER);
}
```

The validation of the accelerometer is performed by tilting the mobile left or right or free fall motion. As soon as the there is a tilt or the mobile orientation then our Android application senses that there is a risk situation and starts to perform the operation of tracking the location information of the user before that, the application waits for 14 se

c for user to be interactive, where user can perform 'cancel' and "send". If there is no user interaction then automatically application sends an emergency pre-recorded voice message along with longitude & latitude to Emergency Response Service 108.

"Pre-Recorder Voice Message Sends To 108"

Conclusion

108 ambulance services is successfully running in India, there is a huge potential like this application, if it is being officially tied-up with 108 ambulance service then such effort might save many person's life.

References

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