Automatic Accident Detection and Reporting Using Life Saver Application

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Abstract— Road accidents are dreaded incidents which are known to take about 146 thousand lives in a year in India itself This system proposes the solution, where the users phone itself initiates a communication to report the accident to the respected authorities. Here an application is being installed in the respective device which will send messages to the emergency numbers those are added at the time of installation of application in the smartphone including the location where the accident occurred. At the time of accident, the smartphone will detect the accident strike and by using accelerometer measurements are being taken, an alert message will send to the emergency numbers including the relatives, hospital and to the police station automatically. Here a threshold value is setted for an accelerometer reading, if the threshold value of accelerometer exceeds, the automatic alert message will send to the respective numbers. This message consists not only the alert of accident but also the exact location of the accidental spot. The alert message is sent using SMS module and the exact location of accident is spotted by using the GPS. This system is taken place using an android application and the user must to carry the smartphone while driving. Now that is not a mandatory case because all are with the smartphone with them always. Proposed system is user friendly and it don't force any user to carry any other devices but only the device which is already with them.

Keywords—GSM,GPS,Accelerometer,Threshold

I. INTRODUCTION

A large number of deaths are caused by Traffic accidents worldwide. The global crisis of road safety can be seen by observing the significant number of deaths and injuries that are caused by road traffic accidents. In many situations the family members or emergency services are not informed in time. It is usually seen that about 32% all such accidents are attributable to motorcycles only and out of which 23% lose their lives. It is easy to blame the 98.6% of bikers who died didn't wear a helmet but what about the 1.4% who did their part of trying to protect themselves from an injury? Reports suggest that these cases are primarily due to the delay in taking such casualty to a hospital. [1] This can be avoided if the process of reporting an accident became automated. Thus, we propose this solution, where our smartphone itself initiates a communication to report the accident using the person's phone. Here our project work on the mobile application. The user can login to our application, Life Saver. The user can add relative's mobile numbers in the application. The accident strike will be detected with the help of accelerometer residing within the smartphone. when the user set the application for a ride, the accelerometer starts

reading x,y,z coordinates and we set a particular threshold value in accelerometer and the value from the coordinate are much more higher than the threshold value a message is being sent by the application. The message will give to police station, hospital and relative. The message will include the location of the spot where the accident had taken place. Therefore, the people can get the location and give further medical attention to the people who met with an accident the can get further help from police station, the hospital authority can further arrange ambulance service for the casualties and to get the medical attention. The relatives can also help the people by taking them to the hospital. The police station receives the message they locate the area and they will contact nearby police which is near to the accident spot and the they will help the people who met with the accident. Section I contains the introduction, Section II contains the related work, Section III explain the methodology with system architecture, Section IV contain the results and discussion, section V concludes research work with future scope.

II. RELATED WORK

An accident is an unexpected and unintended event. Lekshmi Devi P author of Smart Helmet Using GSM & GPS

Technology for Accident Detection and Reporting System suggests technology of smart helmet. Helmet is best safety equipment for driver. In this system initially try to avoid accidents by using, a danger Zone indicator (RF transmitter) circuit, even though the accident occurred the vibration or MEMS sensor will activate the GPS to find the location and further SMS will send to ambulance and family members [3]. GPS and GSM makes the usage for intimation regarding an accident and identification of place, if motorcycle met with an accident it gives an information about location where he is met with an accident through GSM module. So to trace out the location where exactly accident occur using GPS module, and gives to ARM7 Processor, then it sends the SMS which contains the latitude and longitude of an area to family members [3].
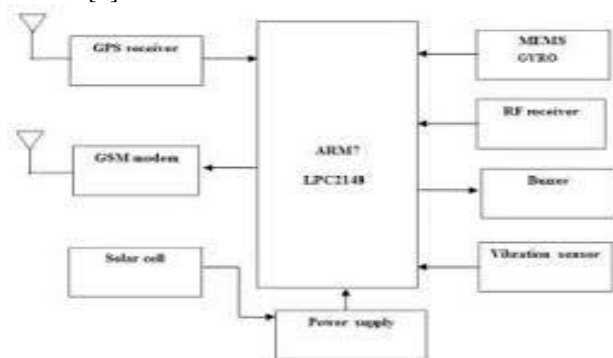

Figure 1. Block diagram of smart helmet

III. METHODOLOGY

The idea is to develop a system to detect human bike accident using the user's smartphones. Every smartphone contains a sensor network for the normal working of phones. These sensor network mainly contains a accelerometer and an gyroscope sensor. With the help of our application LIFE SAVER these sensors can be reassigned to detect any bike accident. The accelerometer and gyroscope can measure the changes in direction accurately. So when an accident occurs the sensor network inside the phone calculates the XYZ coordinates with the help of lifesaver app to verify whether it is an accident. A user must register with their name, username, email id, blood group, relatives phone number in LIFE SAVER application. So when the LIFE SAVER detect
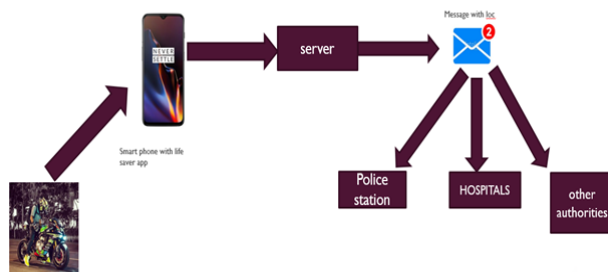

Figure 2. System architecture

the accident it sends an alert message with the location where the accident occurred to the nearby police stations and relatives, then further rescue procedure can be taken easily performed.
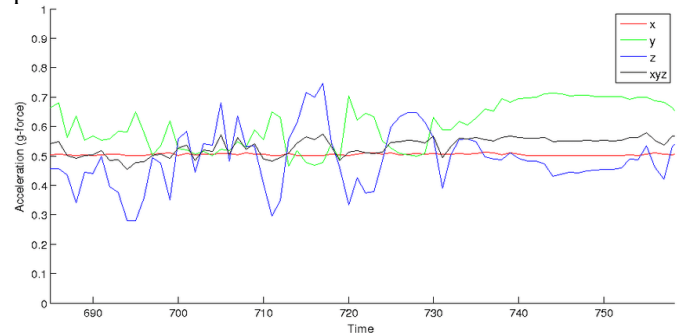

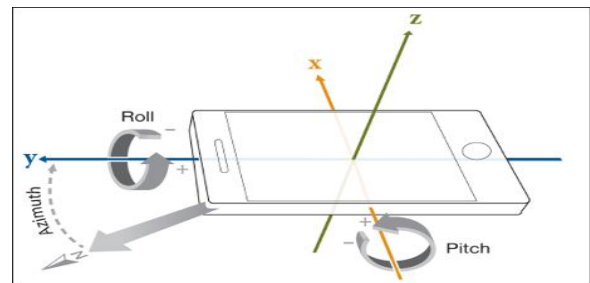Figure 3. Accelerometer time graph

Figure 4. Accelerometer working

```
int numberOfHolesAndBumbs = 0;
    float accel;
    float accelCurrent;
    float accelLast;
    int shakeReset = 2500;
    long timeStamp;
 // ACCELEROMETER LAST READ EQUAL TO THE
CURRENT ONE

    accelLast = accelCurrent;  // QUICK MAFS TO
CALCULATE THE ACCELERATION

 accelCurrent = (float) Math.sqrt(x * x + y * y + z * z);
 // DELTA BETWEEN THE CURRENT AND THE LAST
READ OF THE ACCELEROMETER

float delta = accelCurrent - accelLast;
// QUICK MAFS TO CALCULATE THE ACCEL THAT
WILL DECLARE IF IT
SHAKED OR NOT

 accel = accel * 0.9f + delta;
 // DID IT SHAKE??

if (accel > 5) {
        final long timenow = System.currentTimeMillis();
        if (timeStamp + shakeReset > timenow) {
```

```
    return;
  }
  timeStamp = timenow;
  numberOfHolesAndBumbs++;
```

IV . RESULTS AND DISCUSSION

Lifesaver sends an alert message to the concerned authorities and the relatives of the user. The accident is monitored using the accelerometer that is available in the smartphones. Here when the accelerometer reaches above a premeasured and calculated threshold limit then an alert message is generated with current location of the user and is send to the concerned authorities and the relatives of the user. By using the feature of speaker in the smartphone a high frequency alarm also produced through it.
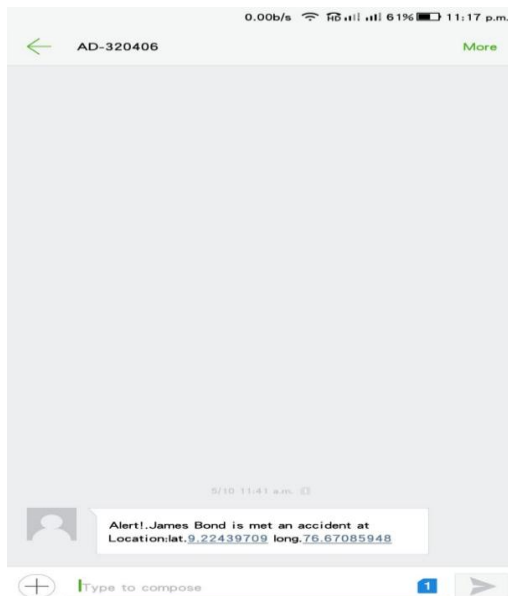

Fig 5. Alert message

V. CONCLUSION AND FUTURE SCOPE

Life saver: An Automatic Accident Detection And Alert System For Automobiles is used for providing help to the accident victims. The proposed system is developed to rescue accident victims as fast as possible Application sends the accident message to the nearest control station as well as to the emergency number provided by the application user. Life saver is very reliable and cost of installation is very cheap. Thus this system provides an easy and efficient way to decrease accident rates and precious lives of a human beings without any additional cost.

The major drawback of the system is that it is unable to work without proper network connection. As a Future Scope we can include cloud as a server. if any emergency authority has message system, use Lifesaver to connect by using API.

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