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Derive Recommendations for Improving Scooter Rider Safety

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Abstract: Recently, mobile phones are one of the most popular devices among people; so that people's life in many aspects is dependent on them. Among platforms for mobile devices, Google's android platform is currently one of the most interesting developments in the mobile phone market. The purpose of this paper is to define the requirements for creating an Android application for improving Scooter Rider Safety. We aim to reduce the probability of accidents by taking into consideration the travelling speed of a particular vehicle, accelerometer, location-based services and Fall Detection based on movement. This document will outline all of the necessary information to start development.

Keywords: scooter, safety, accidents, probability, accelerometer, fall detection, mobile jammer, speed alert, location-based service, android

I. INTRODUCTION

With increasing use of mobile phones, we need a standardized application to detect emergency situations. This project is to take the existing tools in a mobile device and use their functionalities to develop an Android application to implement Scooter Rider Safety. When riding a two-wheeler, a major distraction is the use of a mobile phone and we aim to develop an application to prevent accidents resulting for the same.

This includes:

- To prevent accidents through measurement of the speed at which the person is riding the vehicle and alerting the driver in case if speed exceeding. If the rider exceeds a certain speed limit then the rider would be alerted about the same through techniques such as phone vibration alerts.
- To detect any accidents by detecting and measuring the fall. A fall detection algorithm will be used for this purpose which detects a fall by measuring the angle with the help of accelerometer and gyroscope.
- Automatic call diversion or blocking of incoming calls when a person is riding or driving and also sending the caller a notification, informing him about the details of the driver's location and details. If a rider receives a call when the speed limit exceeds 20km then the call would be barred. The rider will receive a notification later on regarding the caller's information.
- In case the bike gets towed, then the rider can enter the current location and retrieve details of the towing services of that particular area.

II. OVERVIEW OF ALGORITHMS

A. Fall Detection Algorithm

The aim is to implement a fall detection algorithm on Android Mobile OS by analyzing the accelerometer data. Following that, it will inform relatives or caregivers to take action via SMS about the location of the fallen. A user friendly application and settings interface is designed.

Accelerometer provides acceleration values in direction of x-, y-, and z- axis. First separate values of three axes are checked using a threshold value. When the total amplitude of acceleration exceeds the threshold; we report that it is a fall. In case of a fall, to ensure that the fall is legitimate, the user is asked if the fall is genuine. If the user enters within specified limit that it was an illegitimate fall, no text message is sent. Else a text message to listed emergency contacts is sent.

$$AT = \sqrt{A_x^2 + A_y^2 + A_z^2}$$

The data from the smartphone built-in accelerometer is continuously screened when the phone is in the user's belt or pocket. Upon the detection of a fall event, the user location is tracked and SMS and email notifications are sent to a set of contacts. The accuracy of the fall detection algorithm here proposed is near 97.5%.

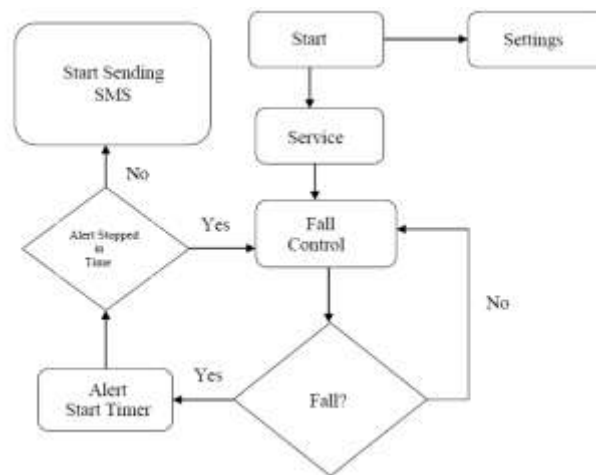


Fig.1 Working of Fall Detection Algorithm

III. WORKING

A. Vibration Alert to User

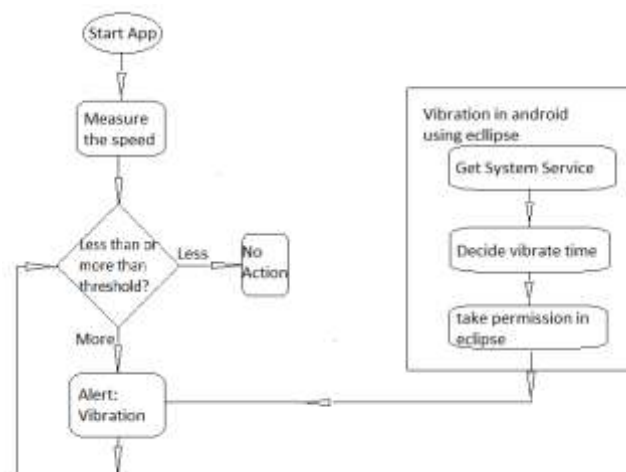


Fig. 2 Working of Vibration Alerts

If current speed exceeds limit, then the user is alerted by vibrating the phone. The device will continue to vibrate until the user reduces the speed to within the city limits.

B. Towing Van Detail Retrieval

A pre-defined database will be present, either on the cloud or as a local database. In case of bike loss due to No-Parking, the user will be notified of the nearest towing station address for ease of the user. The user needs to enter details of current position and the database will retrieve the required location.

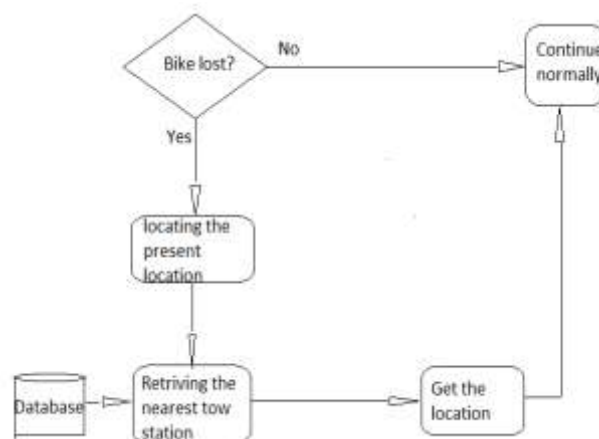


Fig. 3 Working of Towing Van Data Retrieval

C. Call Blocking Technique

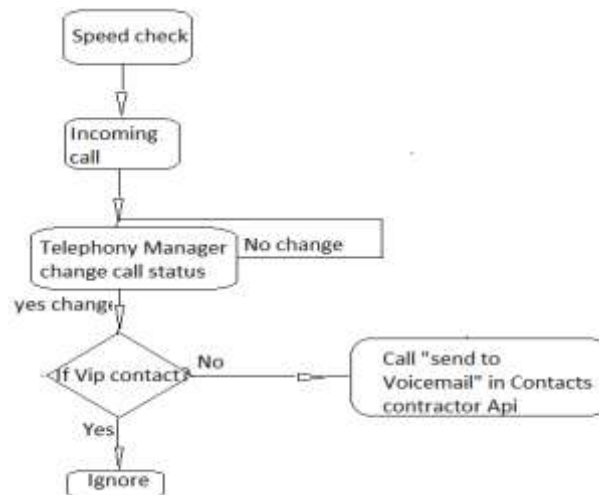


Fig. 4 Working of Call Blocking Technique

A major cause of road accidents is the use of mobile phones to answer calls while riding. With the help of the above technique, the above can be controlled. If an incoming call is detected, the call status is changed. On detection of this change, VIP contact is checked. A special case of VIP contacts is included, for those contacts that must not be ignored while using the app. It could include anyone from family members to company bosses, etc. If it is a VIP contact, then the technique is ignored. Else the call is sent directly to Voicemail.

IV. CONCLUSION

Rapid economic growth has resulted in increase in new vehicle sales in recent years. This rapid expansion of vehicles has put extra stress on accidents public health, and these issues need to be addressed urgently. This paper has provided a brief overview of algorithms that can aid in this. In conclusion the overview of all different approaches and algorithms used in Scooter Rider Safety clearly suggests that the modern approaches that take into consideration more factors tend to give a better, more relevant and appropriate result. But, it is to be also noted, that, with the expanse in inclusion of various aspects, the complexity of the algorithm is affected drastically. Despite this increase in complexity, the result obtained is more pertinent to the user. In future, we can hope for more innovative approaches that aim to completely satisfy user requirements.

V. REFERENCES

- [1] Noury, N.; Rumeau, P.; Bourke, A.; ÓLaighin, G.; Lundy, J. A Proposal for the Classification and Evaluation of Fall Detectors. *Irbm* **2008**, 29, 340–349.
- [2] Perry, J.T.; Kellog, S.; Vaidya, S.M.; Youn, J.; Ali, H.; Sharif, H. Survey and Evaluation of Real-Time Fall Detection Approaches. In Proceedings of the 6th International Symposium on High-Capacity Optical Networks and Enabling Technologies (HONET 2009), Alexandria, Egypt, 28–30 December 2009; pp. 158–164.
- [3] Igual, R.; Medrano, C.; Plaza, I. Challenges, Issues and Trends in Fall Detection Systems. *Biomed. Eng. Online* **2013**, 12, doi:10.1186/1475-925X-12-66.
- [4] Location Based Services By Valerie Bennett <http://www.ibm.com/developerworks/ibm/library/i-lbs>
- [5] Query Processing in Mobile Environments: a Survey and open Problems N. Marsit, A. Hameurlain, Z.Mammeri, F.Morvan

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