A Public Safety Offline Application of Smartphone's and Android OS

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Abstract: Android is a Linux kernel based open source operating system developed by Google. Android primarily designed for smart phones and tablets with touch screen. We explored the Android Operating System and development of software environment and evaluated several of its capabilities by constructing a working application. This is an offline application which collects the speed of the bike/car through Bluetooth transceiver with help of digital speedometer of the bike to determine the location of nearby schools, and if a driver drove over the speed limit in school/college zone, it sounded an alarm to the driver. We believe android smart phones have broad applicability to public safety problems.

Keywords – Android, Smartphone, Public safety

I.INRODUCTION

Smartphone's becomes like one part of human body which has greater features with less expensive. While a person driving he/she may distracted by talking on the phone or sending text messages. In our research study of smart phone technology, we developed a proof-of-concept system that tackled public and traffic safety in restricted zones. Our system tackles the necessity for drivers to pay complete visual attention to the road while still being alerted to the speed of the bike/car. The system integrates the android application and Bluetooth communication to make the driver to being alerted while crossing the speed limit and restricted zone.

The rest of the skeleton of the paper as follows. We review the relevant technology in Section II. In Section III, we discuss a proof-of-concept system to increase public safety and its implementation. Section IV is the conclusion including a discussion of our future direction.

II.BACKGROUND

3.1. Android Software

Android is a middleware software stack mobile operating system. In November 2007 Google bought Android from Android Inc[1]. Android uses a DVM (Dalvik Virtual Machine) which is designed under the constraint of slow CPU and little RAM. So, it will run on OS without swap space.[2] Google provides the user manual guide to develop android application step by step in their official website of android. Using Android SDK and eclipse plug-in, easily can develop the android application. Android SDK comprises of Android emulator, command line tools such as AAPT (Android Asset Packaging Tools), ADB (Android Debug Bridge) and AIDL (Android IDL Compiler). Figure 1 show android Emulator and Figure 2 shows the android eclipse plug-in.

Figure 1
Android Emulator

Figure 2
Eclipse Plug-in
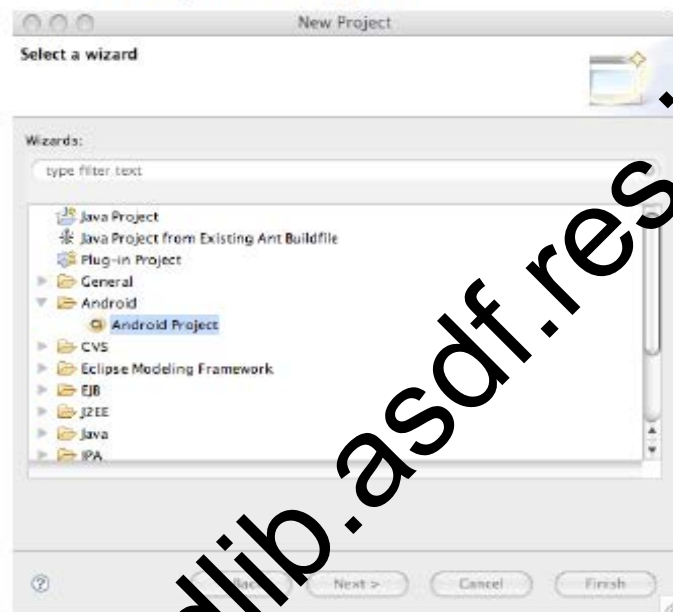
3.2...Android Offline Application:

Android offline application is designed which receives the signal from the bike/car through Bluetooth. The particular city map will be taken and it will be stored in SQLite database. Using simcard's latitude and longitude value, the corresponding user location will be determined. Whenever the driver inserts bike/car key into the keyhole, automatically Bluetooth will get turned on to determine the speed of the vehicle in restricted area such as schools and colleges using Android offline application which works similar to the online GPS system.

3.3...Android Hardware:

To develop the android offline application only 512 MB of RAM and does not need any additional hardware to run the above application.

3.4. Bluetooth:

Bluetooth is a short range standard wireless technology for exchanging the data from fixed mobile devices. It was standardized as IEEE 802.15.1, but this was no longer maintained by Bluetooth Special Interest Group (SIG). It is compatible for smart phones, personal computers, laptop and Tablet PC. It supports up to 60 meters. This project uses Bluetooth to obtain the speed of the bike/car using speedometer of the respective vehicle and transmits to the driver's mobile phone when the speed limit is crossed.

3.5. Speedometer:

Speedometer is a gauge which measures and displays the corresponding speed of the vehicle. In digital speedometer, the digital information of the speed of the bike/car will be taken and it will be transmitted to the driver's smart phone through Bluetooth to sound an alarm.

Figure 3
Transmission of data
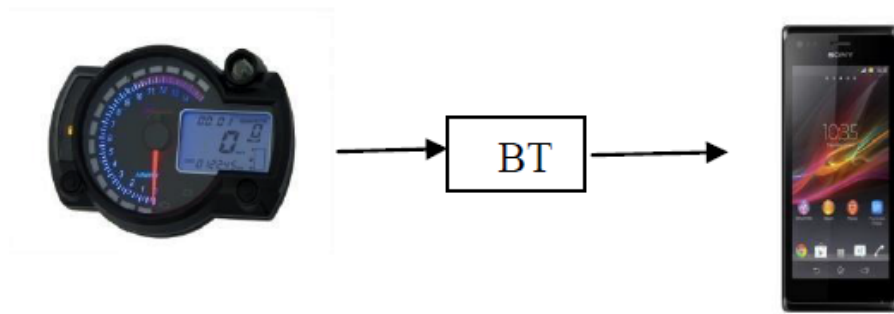
IV.PROOF-OF-CONCEPT

Most of the restricted zones such as school/colleges in and around Asia have a speed limit of 20 MPH. Hurried drivers will try to go as fast as possible while driving even when they are crossing restricted area. Some of the drivers may not conscious and not aware of problem when they are crossing the restricted area with no speed limit. We are proposing an application that that uses Android's functionality to help solve this problem by sounding an alarm if device was in restricted area.

The map of the particular city has to be taken and restricted areas are considered as nodes which have the value of 1 using the graph datastructure. Using the simcard's latitude and longitude, whenever the particular vehicle crosses the restricted area beyond the speed limit, alarm will be sounded using digital speedometer value which will be transferred to Android Offline Application through Bluetooth.

Fig.4 depicts the output of the actual speed outside the restricted zone. Fig.5 depicts the output when the driver drove beyond the speed limit. An audible alarm also played from mobile when driver goes beyond the speed limit.

In a restricted zones, the intensity of the alarm increased as the driver drove beyond the speed limit. As the driver slowed, the alarm intensity will decrease. This sound system depicts that the vehicle was travelling at an acceptable speed. Testing the application through emulator shows the output as expected.

Figure.4
Driving at normal speed

Figure.5
Driving beyond limit in school zone

IV.CONCLUSION AND FUTURE WORK

The Android platform proved to be capable of supporting different kinds of application. Our example application showed that receiving data from the bike alert user by sound when driver droves vehicle beyond the speed limit. Many more novel applications are possible in Android by its great support by the official website. In future, the same application can be developed to cover the entire state or country. The same application can be developed with extended functionality to know the current road status and traffic information using GPS. Using the sensor when the driver met accident, from android mobile an emergency call can be made automatically.

REFERENCES

[1]. Google bought Android from Android Inc[http://moss.csc.ncsu.edu/~mueller/g1/introduction-to-android-845.pdf]

[2].Dalvik Virtual machine [http://sites.google.com/site/io/dalvik-vm-internals]

[3] US Government Global Positioning System, http://gps.gov/ [last accessed on Oct 16, 2014].

[4] 3G, Assisted GPS Test Calls for 3G WCDMA Networks, http://www.3g.co.uk/PR/November2004/8641.htm [last accessed on Oct 16, 2014].

[5] Open Handset Alliance, Open Handset Alliance Announces 14 New Members, http://www.openhandsetalliance.com/press_120908.html [last accessed on Oct 16, 2014].

[5] Google, Inc., What is Android?, http://code.google.com/android/what-isandroid. html [last accessed on Oct 16, 2014].

[6] Computerworld, Inc., iPhone Apps distribution still an Issue for Business, http://www.computerworld.com/action/article.do?command=viewArticle Basic&articleId=9095398 [last accessed on Oct 16, 2014].

[7] The Apache Foundation, Licenses, http://www.apache.org/licenses/ [last accessed on Oct 17, 2014].