Android Profile Switching
Sachin Darekar¹, Nidhi S. Singh², Viddini P Patil³
Professor¹, Student², ³
Department of Information Technology Engineering
Bharati Vidyapeeth College of Engineering, Mumbai University, Navi Mumbai, India

Abstract:
There are many places like Hospitals, Universities, Corporate offices etc. where it is clearly mentioned, “KEEP YOUR MOBILE PHONES SILENT!” usually people forget to keep their mobile to the “Silent Mode” which is not feasible every time. This application provides near about completely automated profile switching according to location. This application will enable the device to switch to the ‘Silent Mode’ in locations like Hospitals, Major Corporate offices, Universities, Well known Educational Complexes, Petrol pumps, Government offices etc. by default & there will be no need to set them manually. This application is also user friendly, when the device is also in locations not belonging to any of default zone; it can switch to ‘user defined profile mode’ by using user defined settings.

Keywords: Global Positioning System (GPS), Android, forward geocoding, reverse geocoding, profile mode switching, SQLite database, GPS Server.

I. INTRODUCTION

This application switches the profile to not only ringer mode but the entire sound profile is auto adjusted smartly according to the location the user sets. In this application user has to set the location once or first time when he/she using it & then it switches profile at that specified location which means it is not completely automated. This new application will provide up to certain extend give the feel of automated profile switching according to location. This application will enable the device to switch to the ‘Silent Mode’ in locations like Hospitals, Major Corporate offices, Universities, Well known Educational Complexes, Government offices etc. by default & there will be no need to set them manually. This application also has User-Defined mode in that, when the device is in locations not belonging to any of above category; it can use ‘User-Defined Switching Mode’ for automatic switching. In User-Defined Switching Mode user set location that does not belongs to any of Default Switching Location as User-Defined Switching Location e.g. User’s Home, Gym etc. here the user need to set the mode according to his/her wish. Here in User-Defined Switching Mode SQLite database will be used which is already present in Android Devices. Storage capacity of SQLite database is depends on memory of device (i.e. Whether SD Card is present or not). As application provides such a large range of Default Switching Locations, the storage capacity for User-Defined Switching Locations, termed as User-Defined Silent Zone is quite enough. The application will use GPS Service provided by GPS Satellites for finding locations & will also use the GPS Server Database for finding the Default Switching Location which will termed as Default Silent Zones. If there is any emergency, someone calling you or they might need your help and just imagine your phone is in silent mode, so to avoid certain situation so if any call from the same number take place continuously more than three time within specified time period then your phone will switch from a silent mode to the ringer mode. But before that you need to set that number in emergency number mode. In profile switching operation application actually switch the ringer mode of profile. Here user can choose among Silent or Vibrate only ringer mode for switching purpose. In default for Petrol Pumps the profile will switch to flight mode & user will not be able to make any changes in it.

II. SYSTEM ARCHITECTURE

The system architecture consists of the GPS System, Android Device, and User components. The User can interact with Android Device through User Interface. The Android Device uses Location Manager Interface and receives location data using Forward Geocoding and also can get address of location using Reverse Geocoding from GPS System.
Device and GPS System. Using Forward Geocoding method Android System will get the co-ordinates of Android Device from GPS Satellite through Location manager. Then those co-ordinates will send to GPS Server Database to get name and address of location this method is known as Reverse Geocoding. After getting name and address of location, the Android System will check that whether the received address is belongs to Default Silent Zone or not. If device is in Default Silent Zone then Android System will switch sound profile ringer mode to Silent or Vibrate only as per settings. If location does not belong to Default Silent Zone then Android System will check for User-Defined Silent Zone in SQLite Database which is already present in Android Device. If location does not belongs to either of Silent Zones then switching not takes place. User can add location for automatic profile switching. Using User Interface user can store location information i.e. co-ordinates in the SQLite Database. While storing the location user can give any name for the particular location, also he will able to choose switching mode i.e. Silent or Vibrate Only and Activation status. User will also able to change settings for User-Defined as well as Default Switching and turn on/off the application through Settings.

III. WORKING

A. Default Mode Switching

In Default Mode flow of processes will be as follows.

1) Finding coordinates of current location of Device

As mentioned above GPS receiver (i.e. our android device) calculates the coordinates of current location using Forward Geocoding method. A software interface of Location Manager is used to get the coordinates from GPS receiver in Android Mobile Device

2) Getting address of location from GPS Server

Using Reverse Geocoding method, device finds out the address of the location of device. Using Location Manager Interface device sends the coordinates of location to GPS Server as a key to find out the address of that particular location. If location entry is present in GPS Server Database, GPS Server sends back the address for that location in form of multi-line text (list). If location entry is not present GPS Server sends the NULL value. While finding the address of location device consider an imaginary circle of radius r, and it finds out the address of all points lying inside that circle. The value of radius r gets vary according to the type of Default Silent Zone.

1) Checking if location belongs to Silent Zone

After getting the response of GPS Server, if GPS Server sends NULL value then it means the location is not belong to Silent Zone else device will check for substring in address such as School, College, University, Hospital, Pvt. Ltd., Government of, Petrol Pump etc. and none of above substring is followed by ‘Road’, e.g. ‘...College Road’ or ‘...University Road’ etc. If above conditions are satisfied by the address get in response from GPS Server then the location is belong to Silent Zone. As discuss in previous point the value of radius r of the imaginary circle consider by the device, gets vary according to the type of Default Silent Zone.
4) **Switching sound profile accordingly**

If location is not belongs to any of the Silent Zone then maintain ringer mode as ‘General’ else switch ringer mode as per setting to Complete ‘Silent Mode’ or ‘Vibrate Only Mode’ or ‘Flight Mode’ (in case of Silent Zone is a Petrol Pump). Diagrammatic representation of working of application in Default Mode is shown in figure 2.

5) **Switching sound profile accordingly**

If location is not belongs to any of the Silent Zone then maintain ringer mode as ‘General’ else switch ringer mode as per setting to Complete ‘Silent Mode’ or ‘Vibrate Only Mode’ or ‘Flight Mode’ (in case of Silent Zone is a Petrol Pump). Diagrammatic representation of working of application in User-Defined Mode is shown in figure 3.

B. **User-Defined Mode Switching**

If current location is not belong to Default Silent Zone then and then only device work in User-Defined Mode. In User-Defined Mode flow of processes will be as follows.

1) **Finding location in SQLite Database**

Coordinates of current location find in Default Mode will be used in User-Defined Mode also. Using those coordinates device checks the entry made by user for that coordinates in its SQLite Database. If device founds entry in SQLite Database then device is in Silent Zone else not.

2) **Checking status of location**

If device is in Silent Zone then device checks the status for that user-defined location.

C. **User Settings**

User Settings helps user to control the switching process in both Default Mode and User-Defined Mode. It provides following functionalities.

1) **Turn on / off Application**

This function provides the facility to turning on / off this application to the user. This application is capable to run in background process. After installation, if user don’t want to use the application then he can turn off the application and whenever he want he can turn it on again.

2) **Enable / Disable Default Mode**

Using this function user can decide that in his running application whether he wants Default Mode to be activated or not.
3) Enable / Disable User-Defined Mode
Using this function user can decide that in his running application whether he wants User-Defined Mode to be activated or not.

4) Silent / Vibrate / Flight Default Mode
User can set switching mode (i.e. Complete Silent or Vibrate only or Flight) for Default Silent Zone using this function.

5) Silent / Vibrate all User-Defined Mode
User can set switching mode (i.e. Complete Silent or Vibrate only) for User-Defined Silent Zone using this function.

6) Set new User-Defined Mode
This function helps user to add new locations (Not more than 20) in User-Defined Silent Zone (i.e. in SQLite Database).

7) Update User-Defined Mode
This function helps user to update (i.e. edit or delete) existing locations in User-Defined Silent Zone (i.e. in SQLite Database).

IV. FEATURES AND FUTURE SCOPE
A. Features
Wide range of default locations, such as educational complexes, medical complexes, government and corporate offices etc. Provision for adding those locations in silent zone which are not covered in Default Silent Zone. User-defined accuracy setting for user-defined locations. User-defined locations are stored in device’s SQLite database and not in GPS Server Database hence GPS Server Database is not get disturb for adding new user-defined location or updating existing user-defined locations.

B. Future Scope
One can make location based triggering application without making lot of changes in this application. Instead of profile switching one can design this application for call divert also, so whenever he enters into the Silent Zone his all calls will be diverted on some another number specified by him. One may use navigation map system to set user-defined locations.

V. CONCLUSIONS
Android Profile Switching Application in Android Mobiles is a next level of Location Aware Intelligent Software which reduces human intervention for simple task such as sound profile switching. Android Smart Phone becomes much smarter by this application.

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VII. REFERENCES