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# LOCATION BASED AUTOMATIC SOUND PROFILE SWITCHING APPLICATION IN ANDROID MOBILES

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**Abstract-** This is an Android application for automatic profile switching as per location. There are many places like Hospitals, Petrol pumps, Universities, Corporate offices etc. where it is clearly mentioned, "KEEP YOUR MOBILE PHONES SILENT!!" Many times people forget to switch the mobile to the "Silent Mode" which is not feasible every time like in an important meeting, lectures etc. This application provide 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 in that, when the device is also in locations not belonging to any of above category, 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

There is an application for Android as well as Windows Smart Phones named as "Phone Weaver". That application switches the profile to not only ringer mode but the entire sound profile is auto adjusted smartly according to the time or location user sets. But still it has some limitations. In that application user has to set the location first & then it switches profile at that specified location. Which means it is not completely automated. This new application will provide 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 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. Same like "Phone Weaver" 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 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). Considering for lowest memory (i.e. there is no SD Card), so this application can store only 20 entries in User-Defined Switching Mode. 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*. 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.

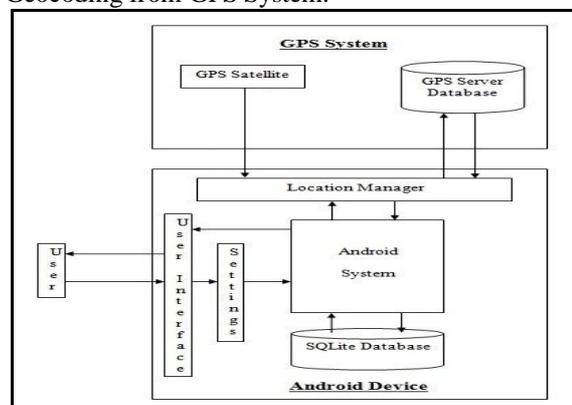


Figure 1. System Architecture

As shown in figure, the GPS System consists of GPS Satellite & GPS Server Database. The GPS Satellite continuously transmits the signal containing information about receiver's location (i.e. Location of GPS receiver with respect to GPS satellite, Current time etc.). Using this information GPS receiver calculates coordinates of location (i.e. Longitude, Latitude, and Altitude). The GPS Server Database stores the information of locations such as coordinates of location (i.e. Longitude, Latitude, and Altitude) and name and address of that location.

In the Android Device, the Location Manager is an interface between Android 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 will 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 the points lying inside that circle. The value of radius *r* gets vary according to the type of *Default Silent Zone*.

*3) 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*. Thus value of radius *r* with respect to the type of *Default Silent Zone* is shown in table below.

TABLE 1 TABLE OF RADIUS *r* WITH RESPECT TO TYPE OF DEFAULT SILENT ZONE LOCATION

Type of Default Silent Zone Location	Radius <i>r</i> (in Meters)	Switching Mode
School	75	According to User Setting Silent / Vibrate
College	250	According to User Setting Silent / Vibrate
University	2000	According to User Setting Silent / Vibrate
Hospitals	100	According to User Setting Silent / Vibrate
Government Offices	75	According to User Setting Silent / Vibrate
Corporate Offices	150	According to User Setting Silent / Vibrate
Petrol Pumps	50	Flight Mode

		(inaccessible to user)
Theatres and Multiplexes	75	According to User Setting Silent / Vibrate

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 figure2.

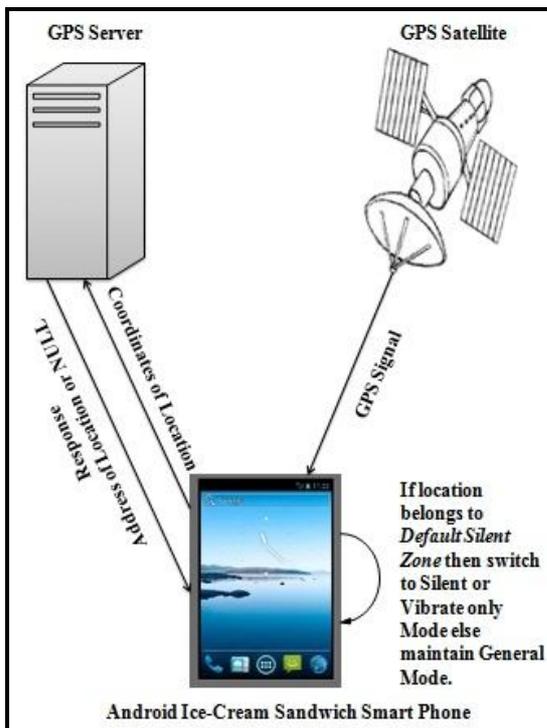


Figure2. Diagrammatic representation of working of application in Default Mode

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 finds 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,

whether it is activated or not. If it is activated then device is in *Activated Silent Zone* else not.

3) *Switching sound profile accordingly*

If location is not belongs to the *Activated Silent Zone* then maintain ringer mode as ‘General’ else switch ringer mode as per user setting to Complete ‘Silent Mode’ or ‘Vibrate Only Mode’.

Accuracy for switching can also be controlled by user at the time setting new location to *User-Define Silent Zone* or updating existing location in *User-Defined Silent Zone*.

Diagrammatic representation of working of device in *User-Defined Mode* is shown in figure3.

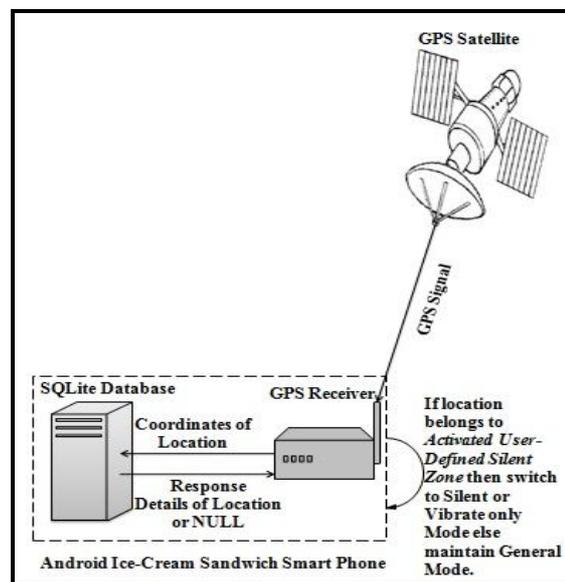


Figure3. Diagrammatic representation of working of application in User-Defined Mode

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

*Location Based Automatic Sound 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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