



GPS Task Reminder for Android Users

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Abstract: In today's busy world people have to remember many things at the same time. It's not possible for human beings to remember all the things all the time. It's when the alarm system comes into picture. Alarm system can be found in all types of phone, from very basic to advanced smart phones. it is one of the most used applications in the phone. Almost every smart phone has in built alarm application in it. This application uses in built clock system of the phone. User can use this application to get alarms of event. in this paper we are implementing a system which gives reminder which is time based as well as location based. Location based reminders are highly beneficial as it triggers only when the user is present at that location. This system combines the features of time and location based reminders.

Keywords: Android application, Google maps, GPS, Location Based Services, Location Based Reminder.

1. INTRODUCTION

Alarms which follow only time constraints are not much helpful as user may wish to do some tasks not at particular time but at particular place [4]. For example, buying a new pair of shoes from particular shop is not time based event; it totally depends on the location of shop. For this type of tasks location based reminders are used. These reminders take account into user's time and his current location. These systems use GPS system to take user's current location. GPS is an in built service provided by smart phone manufacturers so there is no need of extra hardware to carry with. Navigation based applications allows smart phone users to find phone's current location, display it on the map, display additional points of interest (PoI) nearby or use navigation. Exact mechanism of pinpointing current device location is dependent on phone model, available network and connectivity, but generally it is based on phones GPS hardware[3]. User's current location and all his desired places can be easily seen with the help of google maps. Google maps are a free API provided by google.inc and widely used for location based services. Google Maps is part of Android software stack and is available under package com. google. android. Maps [3].

Remaining paper is arranged as follows section 2 contains technologies used, section III contains all system description, section IV contains architectural diagram of system and section V contains mathematical model.

2. TECHNOLOGIES USED

2.1 ANDROID

Android is a mobile operating system developed by Google, based on the Linux kernel and designed primarily for touch screen mobile devices such as smart phones and tablets. Android is the world's most popular mobile OS. Android's user interface is mainly based on direct manipulation, using touch gestures that loosely correspond to real-world actions, such as swiping, tapping and pinching, to manipulate on-screen objects, along with a virtual keyboard for text input. In addition to touch screen devices, Google has further developed Android TV for televisions, Android Auto for cars and Android Wear for wrist watches, each with a specialized user interface. Variants of Android are also used on game consoles, digital cameras, PCs and other electronics. Android's source code is released by Google under an open source license, although most Android devices ultimately ship with a combination of free and open source and proprietary software [8]

2.2 GLOBAL POSITIONING SYSTEM (GPS)

The Global Positioning System (GPS), originally Navstar GPS, is a space-based radionavigation system owned by the United States government and operated by the United States Air Force. It is a global navigation satellite system that provides geolocation and time information to a GPS receiver anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The GPS system provides critical positioning capabilities to military, civil, and commercial users around the world [9].



2.3 SQLite

SQLite is an in-process library that implements a self-contained, serverless, zero-configuration, transactional SQL database engine. The code for SQLite is in the public domain and is thus free for use for any purpose, commercial or private. SQLite is the most widely deployed database in the world with more applications than we can count, including several high-profile projects. SQLite is an embedded SQL database engine [10].

3. SYSTEM DESCRIPTION

3.1 Interface:

3.1.1 Hardware Requirements:

Android smart phone

3.1.2 Software Requirements:

JDK 7 or above

Android studio 1.5

MySQL 5.7

SQLite

Android OS 4.1 and above

3.2 How System Works:

The user is ask to login to the system or register to the system if he has not already registered. This login information is stored in the database of the server. The interests of the user are stored in the database. The screenshots of the application are shown in fig.1 and fig.2.

This screenshot shows the login interface of the 'GPS Based Task Reminder' application. The title 'GPS Based Task Reminder' is at the top. Below it are five input fields with labels: 'Name', 'Email', 'Contact', 'Interests', and 'Password'. Each field has a white underline.

Figure 1: user login

This screenshot shows the registration interface of the application. It features six input fields with labels: 'Name', 'Email', 'Contact', 'Interests', 'Password', and 'Confirm Password'. At the bottom, there is a prominent red 'REGISTER' button and a link that says 'Already a member? Login'.

Figure 2: user login



3.2.1 Location selection for tasks to be done

User can choose various locations from google map. These locations will be stored in database. For adding locations for specific tasks into the database, the application uses Google Maps. By picking up the desired location which is showing on Google Maps, user can add the desired task into the database. This will be used for setting reminder in Location Based reminder application [1]. User can unselect location at any time and he can choose multiple locations at the same time.

3.2.2 Event creation with respect to identified location

User can bind the task or event to be reminded with the locations stored in the database. He can also prioritize the tasks while creating them if there are multiple tasks for the same location. This system follows time constraint also. User can set time for the notifications and the event notifications will not be given even though user is present at that location. While creating the alert user can set the distance limit so that he could get the notifications while he is near the location.

3.2.3 Giving alert for created reminders

If user is near or at the particular location he has set the alert for then the message will pop up on his android phone screen containing the event information and image of location provided the image is already in database. If a location-based task exists in the database, then the application will compare the sensed location with the location associated with the task. When the user is physically close to the predefined location, the reminder then will be triggered to remind the user of the task [1] [2].

3.2.4 Resetting or deleting of task

User may want to do the task some other time than he set the reminder for. He may want to delete the task. This phase asks user if he has done the task or he wanted to do it on some other time. If user hasn't completed the task he can view, snooze, reset or delete the task [6].

3.2.5 Auto Generation of Tasks

Tasks which user does on daily basis like picking kids from school, the system will auto generate the tasks or set that task for every day or days specified by user.

3.2.6 Internet based recommendations

Internet based recommendation for tasks which are purely location based. For example, if user has set a task to buy shoes from particular shop, the recommendation will be given to user for buying shoes from another places which user may like to check.

3.2.7 Offline task creation of task

The system can be used even though it is offline. User can set, view, create or delete the task when he is offline. But location binding is done only after system is connected to internet.

4. ARCHITECTURE

The architecture diagram of the system is as shown in the fig 3. Application consists of two parts: Client application for mobile devices based on Android platform and Web service for updating content of applications [7]. For server side storage MySQL and for mobile local data SQLite is used. JDBC is used for database connectivity in the application.

The application uses Google maps API for user interface. The user predefines the task on particular location with the help of google maps. This predefined of tasks is stored on the server's database using SQLite. The built in GPS receiver of the smart phone receives the signal from GPS satellites. Using these GPS readings, the application can perform geolocationing to sense the location of user. Then the application checks for the location-based task in the database and compares the sensed location and location associated with the task. If user is present near that location then application triggers notification.

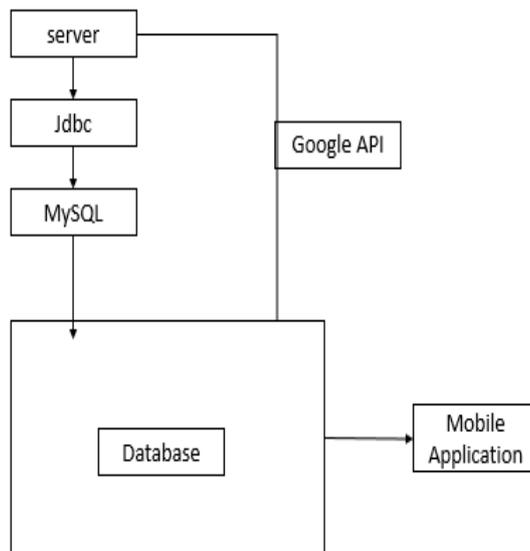


Figure 3: system architecture

5. MATHEMATICAL MODEL

Let Assume S be the system which gives location based task reminders.

$S = \{s, e, X, Y, T, F_{main}, NDD, DD, Success, Failure\}$

S (System) = is our proposed system which includes following tuple.

s (initial state at time T) = GUI of search engine. The GUI provides space to enter an event for user.

X (input to system): Input Event. The user has to first enter the event with location. The event also contains all task information with its location, time and priority.

Y (output of system): List of all events with locations. **T (No. of steps to be performed)** : 6. These are the total number of steps required to create an event and give notification.

f_{main} (main algorithm): It contains Process P. Process P contains Input ,Output and subordinates functions. It shows how the event will be processed into different modules and how the results are generated.

DD (deterministic data): It contains Database data. Here we have considered SQLite which contains number of queries. Such queries are user for showing results. Hence, SQLite is our DD.

NDD (non-deterministic data): No. of input events. In our system, user can enter many event with number of locations so that we cannot judge how many events user enters into single session. Hence, Number of Input events are our NDD.

Memory shared: SQLite. SQLite will store information like list of information about Bus, registration details and numbers of Bus. Since it is the only memory shared in our system, we have included it in the SQLite.

CPU_{count}: 1. In our system, we require 1 CPU for server.

Success = successfully gives notifications to the user at desired location and time

Failure = Failed to give notification.



6. CONCLUSION

Location based task reminder is a system which is time as well as location based. Instead of remembering all tasks, user can just store all his tasks into this system with time and location information. He will get all the notifications in his android device.

To use this system user should have internet connection and his GPS on. Without internet and GPS, this system cannot be used fully. To do daily tasks effectively without forgetting, this system is highly useful.

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