Implementation of Location based Alarm System in Android using GPS

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Abstract- *Smartphone shipments can rise to account for over 1/2 all cell phones for the primary time. pill PCs like Apple iPad and Google Android-based tablets additionally boost the employment of non-public task management applications in our everyday life.. In general, tasks can be broadly classified into two categories: (1) time-based tasks, (2) location-based tasks. If a task is time-based, we mean that the task should be carried out at a specific time. For example, taking medicine at 9 p.m. every day is a time-based task. To remind ourselves of this kind of tasks, we can set an alarm in the personal task manager to make a "just-in-time" prompt. On the other hand, if a task is location-based, we mean that the task should be performed at a specific location, such as to buy a bottle of milk at the convenient store nearest to your home. In this case, setting an alarm triggered by time may not be appropriate if you are not sure when you will be passing by the convenient store. This motivates us to design a location-based personal task reminder, which can provide a "just-in-place" prompt to users .*

Keywords: Global Positioning System (GPS), WLAN, Android Open Source Project (AOSP), Open Handset Alliance (OHA).

1. INTRODUCTION

Many people are overwhelmed by numerous tasks waiting to be done. Tasks are of a wide variety, ranging from daily tasks such as meetings at work to non-daily tasks such as buying groceries after work. To help remind ourselves of these tasks, common practices are to take notes on the paper-based day planners or Post-it and to use personal task manager software on computers and/or cell phones so as to take notes electronically. The latter, which is getting more and more popular in recent years, benefits by the trend of increasing penetration of Smartphone's.

The IEEE 802.11 WLAN technology, also known as "Wi-Fi," has been massively deployed around the globe. Take the municipal wireless networks (also called municipal Wi-Fi) as an example, more than 100 cities own such networks operated by the city governments or ISPs. Take Taiwan as another example, airports, MRT/train stations, museums, homes, hotels, campuses, restaurants, convenient stores, offices, and shopping areas are mostly deployed with Wi-Fi hotspots. The ubiquity of Wi-Fi infrastructure is therefore without a doubt. Moreover, on the Wi-Fi client side, the hardware specification of built-in WLAN interface and GPS receiver becomes the de facto standard on the latest smartphones and tablets. Based on these observations, we find it feasible to implement a location-based task reminder in smartphones and tablets, which combines the GPS and the WLAN technologies for location sensing.

The main features of our location-based reminder are as follows. First, it can be used to remind the users of the tasks in both indoor and outdoor environments, with the aid of the built-in GPS receiver and WLAN interface in Smartphone / tablets. Second, it gives users a unified user experience because all the established personal-meaningful locations can be displayed and managed on the Google Maps[Ref no.3] UI, regardless of the location types. Last but not least, it can become a value-added service for telecom operators with WLAN infrastructure. Over the next few years there is likely to be a dramatic increase in services for the general public which are based on knowing your location. A mobile phone handset is a device on which it will be possible to request the location of the nearest place and be provided with alerts that we reach that place.

The rapid advancements in information technology and wireless communication nowadays it is very necessary for everyone to be updated about current affairs such as mobile phones, news, stock markets, sporting events, etc. Mobile phones have been trend lately. Corporate as well as Consumer products are increasingly geared towards mobility and Location Based Services. This is where our study focuses on the ability of mobile devices which provides software solutions which are location sensitive.

2. LITERATURE SURVEY

2.1 Existing System

Geolocationing is the first step to providing location based services. Common locationing technologies include GPS, Wi-Fi, Cellular, Bluetooth, Infrared, and Radio Frequency Identification (RFID), to name a few. The applicable environment for these technologies varies, and their locationing accuracy also varies, so there has been a great deal of researches aiming at improving the two factors. Using a single locationing technology, Niet al improved the locationing accuracy of RFID by deploying reference tags in the field. Locationing accuracy can also be improved by combining two or more locationing technologies. Bhaskeret al.[Ref no.4] took a different approach by employing user feedback to correct system geolocations with low computation overhead, and their experimental results show very good accuracy in indoor environments.

In terms of the applicability of locationing technologies, our previous work combines GPS and RFID to make a logistics management application applicable for an entire itinerary consisting of both outdoor and indoor environments. Sohn et al [Ref no.5] designed a location-based reminder application named "Place-Its" running on the Symbian S60 mobile phones. They emphasized that compared

with Post-it notes or PDAs, mobile phones are a convenient and truly ubiquitous platform to deliver reminders. Through their experiments, they found that using one's location to trigger reminders is a valuable piece of context to improve the way people use reminders, regardless of the fact that the locationing accuracy of mobile phones is relatively low. They also observed that location was widely used as a cue for other contextual information which is difficult to be detected by any system, inferring the merit of location-based reminders. A similar work can be found where Ludford et al. developed a location-based reminder system named "Place Mail". Their field study shows the usefulness of such a system and also discovers that effective delivery of reminders depends on people's moving patterns and the geographic layout of the space. Location-based reminders can also be used for advertisements. Instead of pushing the advertisements unsolicited to mobile phone users, the work proposed by Li et al. triggers reminders based on previous settings (interested products) by the user oneself. Based on the findings we are motivated to improve the location sensing capabilities of mobile Pers Ubiquit Compute to make location-based personal task reminder more viable in our daily life. It is apparent that the daily schedule for most people includes both indoor and outdoor environments. Therefore, a practical location based reminder should support location sensing in both environments. Moreover, the user study in pointed out that the "Place-Its" reminders triggered on departure were not satisfactory; the reminders came to users attention several kilometers away from where the reminders were needed. Furthermore, a number of location-based reminder applications available at the Google Play [Ref no.6] such as "Location Alert" and "Location Based Task Reminder" [Ref no.7] also suffer from the same problem, because they are unable to sense the location information in the indo or environment. If we can make the location sensing more accurate, this kind of reminders can become more useful.

2.2 Proposed System

Personal task management has been essential for modern people, in order to remind them of something at a specific condition. Reminders based on the electronic calendar in cell phones are popular, but such reminders are mostly triggered by time. It is also common that some tasks are only meaningful to be performed at a specific location, so it would be useful if reminders for those tasks can be triggered only when the person to be reminded is physically near or located at that location. Therefore, in this research we implement a location-based personal task management application for Android-based smart phones and tablets. To distinguish our work from existing ones that rely solely on the GPS technology, this application can be further extended to be used in many other scenarios which comprise both indoor and outdoor environments, such as guiding in public transportation systems or tourist attractions.

1. When the person to be reminded is physically near or located at that location.
2. In this application we also set reminder give emergency call or alert to other mobile. (E.g. when we reach school then automatically reminders go to our parents).
3. Here we will use this concept to implement our "Location based Services" The whole concept is that, when we reach any desire place then our mobile should indicate us to complete some of the task as we have already come here.

The main advantage is that mobile users don't have to manually specify ZIP codes or other location identifiers to use LBS, when they roam into a different location. GPS tracking is a major enabling ingredient, utilizing access to mobile web.

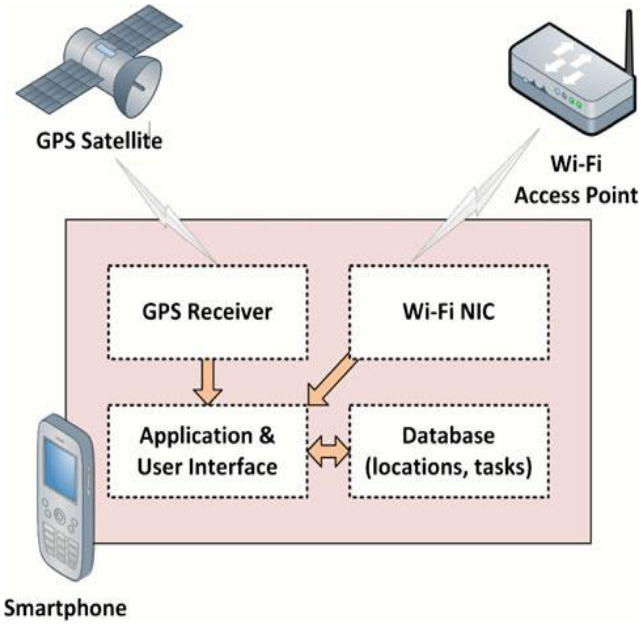


Fig.1 Block diagram of the proposed system

3. METHODOLOGY

3.1 Indoor locationing

The deployment of Wi-Fi infrastructure is essentially ubiquitous nowadays. By taking advantage of the Wi-Fi infrastructure, indo or locationing is handily achievable by sensing the existence of some specific Wi-Fi APs' wireless signals. That is, sensing a specific Wi-Fi AP's wireless signal conceptually means that the user is in vicinity of the location at which the Wi-Fi AP is deployed. Specifically, every AP will broadcast beacon frames periodically, which contain the MAC address of its Wi-Fi interface and its service set identification. Accordingly, a Wi-Fi client device can scan for the beacon frames to acquire the MAC address of the AP in vicinity and then associate the discovered MAC address with a personal-meaningful location. By personal-meaningful locations, we mean that the locations to be saved in the location database can be named according to users own will. For example, one can name a location "My Office", which needs not be meaningful to other people.

Also, we would like emphasize that a Wi-Fi client device can do Wi-Fi scanning even when APs are running the Wi-Fi Protected Access (WPA) security protocols, because we only need to receive the beacon frames rather than establish a Wi-Fi connection with the WPA-enabled AP. It is possible that a Wi-Fi client device can discover a number of APs

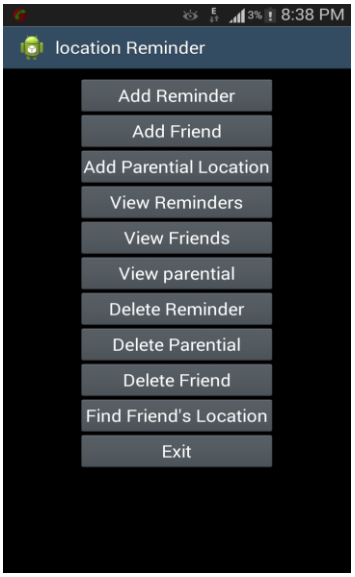
simultaneously when scanning for Wi-Fi connections. This is very common especially in urban areas. Therefore, in our implementation, we allow multiple APs to be associated with one location, to increase the success rate of indoor locationing. In addition, in our application, the indoor personal-meaningful locations should be pre-visited by the user before they are used in the reminders.

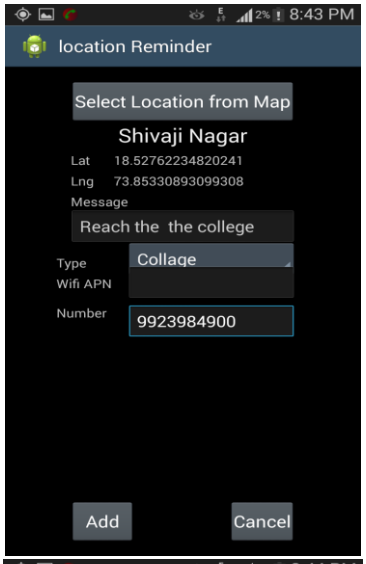
More precisely, the user should be physically located at the location, scan the Wi-Fi APs, and then save the location into the application database. With this prerequisite setting, the users may create reminders and then associate them with the pre-established locations.

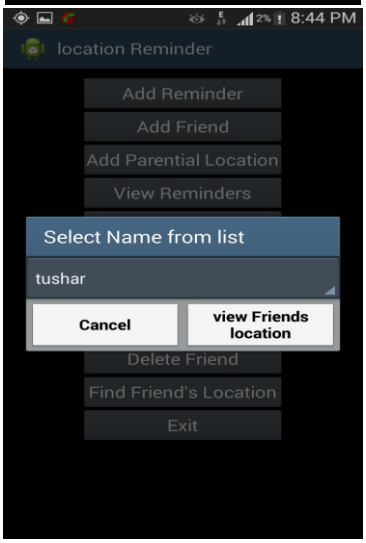
3.2 Outdoor locationing

For outdoor locationing, we also utilize the most popular locationing technology—GPS. To ease adding a personal meaningful location into the database, we use Google Maps as the user interface in our application. That is, by clicking at a specific location on the Google Maps, users can add that location into the database and then use it in location-based reminders. As noted in Sect. 3.2, in the location database, indoor locations are associated with the discovered MAC addresses of the Wi-Fi APs, so the indoor locations should be pre-visited by the users. However, outdoor locations are treated differently we associate outdoor locations with their GPS coordinates. Most importantly, since the GPS coordinates of the outdoor personal-meaningful locations can be obtained from the Google Maps API, the users are not required to be physically located at those locations before using them in the reminders.

4. RESULTS







5. CONCLUSIONS

We implemented a location-based task reminder application for Android-based Smartphone's and tablets. Compared with the existing works, our application takes full advantage of the ubiquitous WLAN infrastructure to achieve better accuracy in indoor locationing. Furthermore, our application gives users a unified user experience because all the established personal-meaningful locations can be displayed on the Google Maps UI, regardless of the location types. Although the current version requires that indo or locations should be pre-visited by the users, this restriction can be easily lifted by incorporating the proposed operating models telecom assisted locationing and social-assisted locationing. With the telecom-assisted locationing operating model, the locationing service can become a value-added service for telecom operators with WLAN infrastructure. Further- more, our work as a foundation of location-based services can be further extended to be used in many other scenarios which comprise both indoor and outdoor environments. We believe that the reminder application we developed can contribute to the promotion of individual well-being. Currently, we are developing a new software version by incorporating the social-assisted operating model to boost the usability of our reminder application. At the same time, we will try to lower the power consumption of executing the reminder application. As described in Sect. 4.3, it is a viable solution to use the built-in accelerometer of the mobile device to detect the

movement of users, so the application will do location sensing only when the user is moving. Finally, after the new version is completed, we will evaluate the usability of our system through the questionnaire on the users.

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