

AN EASY CONTEXT BASED MOBILE SOCIAL NETWORKING SYSTEM

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Abstract: *In today's era, mobile social networking becomes part of life of the people. There are more than 6000 location based applications in the market which are used for online social networking. These applications use some utilities like Global Positioning System (GPS), Geo-coding, Location Based Services (LBS), etc. to provide their location functionalities to the user. Also there are many applications which provide sharing information and messaging services to the users, like WhatsApp. But there is no application available which provides communication between users within some range of current location (context) of the user. We exploit some findings and local attachment model evaluations to describe a new model of context based social networking approach for mobiles that combines spatial proximity, social networking and mobility factors. So this new approach is basically different from previous social network designs with respect to its current context based services made available to users. In this paper, we present a context-based mobile social networking application, which offers chatting service to the users within same range of location. Context is defined as predefined range of the current location of user. By using this application, users can communicate with their friends who are within their context specified by application. This approach of application provides the user to chat with only those friends who are spatially near to the user. An Android Operating System provides features which helps in realization of this application.*

Keywords: *Location Based System (LBS), Social Networking Sites (SNS), Global Positioning System (GPS), Geo-coding, Mobile Communication, Location Based Social Networking (LBSN), Android OS.*

1. INTRODUCTION

Social Networking Sites (SNS) are focused on the relationship between the users and the behavior of user in social network, for example *Facebook*. It provide functionalities to the user by which user can create profile, connect with other users, share its interests and personal activities, see who is online now and find new people.

The main purpose of the LBS is to provide services to the user according to the chosen location. LBS are used in applications which give the knowledge about the particular location and provide recommendations. LBS offers many advantages to the mobile user to retrieve the information of their current location and use this information for various purpose like vehicle navigation system, emergency services, searching places in map, etc.

Many mobile applications use GPS to provide the location of the user. GPS provides location information in the form of latitude and longitude from the world map. GPS work is based on satellite tracking system which provides spatial data which can be used by mobile services to provide information to the LBS.

Geo-coding is used to translate the location information, which is in the form of latitude and longitude, into the name of the location. The Geo-coding lookups are done on the server, so our applications will require us to include an Internet uses-permission in our manifest.

In mobile communication user is capable of sending messages, audios, videos, etc. along with voice. By using mobile internet services it becomes easy to provide these functionalities to the user.

Android is a software platform and operating system for mobile devices which is available as *open source*, which implies that anyone can view and even modify the source code. Android can divide functionality into component and provide communication between these components. All Android application functionalities and system framework are written in java and executed by *dalvik virtual machine* (DVM) which executes its own byte code building dalvik executable file (.dex).

Android's Network Location Provider determines user location using GPS, cell tower and Wi-Fi signals, providing location information in a way that works indoor and outdoor, responds faster, and uses less battery power. With the help of Assisted-GPS (A-GPS) in phones and through Web Services using General Packet Radio Service GPRS, Location based Services can be implemented on Android based smart phones.

Android operating system also provides a rich inter-application message passing system using location information known as *Location API*. There are some different classes of an Android OS present under Location API package to retrieve the Location information of the user.

These classes are given below:-

- ***LocationManager***- This class provides access to the location service. It also provides facility to get the best Location Provider as per the criteria.

- **LocationProvider**- It's an abstract super class for location providers. A location provider provides periodic reports on the geographical location of the device.
- **LocationListener**- This class provides callback methods which are called when location gets changed. The listener object has to be registered with the LocationManager.
- **Criteria**- The class provides the application to choose suitable Location Provider by providing access to set of required properties of the LocationProvider.

2. RELATED WORK

There are many location based applications comprised with android services and provides many functionalities to the users. By using these functionalities or services, users can connect with their friends whenever they want to communicate or share their information. A number of applications are available in the market today; which use some elements of location in a way that adds value to the user.

Some popular examples of currently existing location based mobile social networking systems are:

2.1 FOURSQUARE

Foursquare [2] is a mobile application that allows users to "check-in" at various consumers and retails outlets such as restaurants, malls, hotels, etc. to share their location and earn reward points. It is an example of mobile social networking application with gaming elements that is built around people's check-ins and allow people to search nearby space and locate others. The application basically makes the location tips available to the user which are marked by other users.

2.2 GOOGLE PLACES

GooglePlaces [1] provides the data about the current location/places or any preferred point of interested location to the requested user. There are 4 fundamental Place services available in the Google Place as given below:

- **Place Searches** - It returns an array of nearby Places based on a location defined by the user.
- **Place Details** - It returns more specific data about a user defined Place.
- **Place Check-ins** - It allows user to check-ins Place. Check-ins is used to gauge a Place's popularity; frequent check-ins will boost a Place's priority in application's Place Search responses.
- **Place Reports** - It allows users to add new locations to the Place service, and to delete Places that the application has added to the database.

2.3 FULLCIRCLE

FullCircle [3],[8] is location aware application for mobiles that integrates location awareness with social networking, enabling mobile device users to identify and interact with other registered FullCircle members based on their physical proximity, interests and preferences - quickly, easily, safely and freely. It uses social networking services to allow members to create their own "location based networks" within which users can communicate.

2.4 LOOPT

Loopt [5],[7] is the location based social networking system which provides ability to the user by which user can track the location of their Facebook friends. It can also allow users to receive alerts when their Facebook friends are near to their location. Users can leave comments of the locations they visit and post updates of the next location they may visit. Loopt's community is built on three basic principles- Connect, Share, and Explore.

2.5 GOWALLA

Gowalla [4],[6] is a location-based social networking service created in 2009 and allows users to broadcast their location on Twitter, share photos of places they visit with their friends, and get localized coupons and offers. It also provides the check-in facility to share their current location with other Gowalla users.

3. PROBLEMS IN EXISTING SYSTEMS

Existing systems are working on location based services, and it can provide the information about the object's location to the LBS applications which is used by user to share information. These existing systems are having some problems as given below:

- I. Some existing applications can publicly broadcasts their location information and meant to be viewed by everyone present in their Onile Social Network (OSN). It cannot be able to multicast their location to selected users.
- II. Some existing applications can anonymously broadcast their location information to others, whether users want it or not. It neutralizes privacy concern of users.
- III. Some existing applications can only use location information for personal informatics purposes like fitness-oriented location based application. It is not able to share their location information to their friends or followers.
- IV. Some existing systems can provide location information of other users whenever requested by check-in facility. But it cannot tell user about the friends who are now in user's spatial proximity.
- V. Asynchronous sharing emphasizes ad-hoc location awareness. In most of these applications, when location information is shared with others, it is often indicates that the user was previously or recently at that place, rather than that he/she is currently at that place.

4. PROPOSED SYSTEM ARCHITECTURE

After considering problems in existing Location Based Social Networking systems, we are proposing the system which is Context-based. Context-based system means, a system which works within a specified range of particular current location of the user.

Context-based mobile social networking system provides an ability to chat with other users within application's context. Application can provide real time chat system to the user. It is totally Android based application providing communication between same application users. It can use the GPS and Geo-Coding services of Android OS to fetch

the location information of the user. This application can search other users within its spatial proximity or within its context (within some range). It provides the chatting service to the users who are using this context-based application.

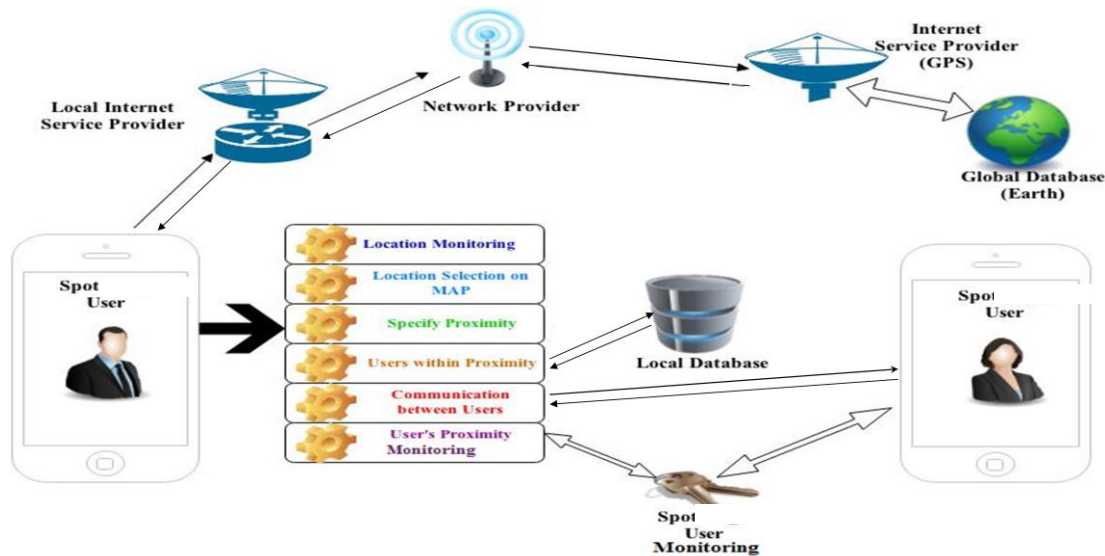


Fig-1: Proposed System Architecture[This architecture is designed in web based online designer tool. Its conceptual realization of the project and is copy right of ©Anurodh Pakhale and Sunil Rathod]

In the architecture shown in figure-1, system can first of all find its own current location using Android GPS services. To obtain current location, system can send request to the local Internet Service Provider (ISP). Local ISP then request to the GPS service through network provider. GPS receiver can communicate with the satellites to find out the requester's location data and then it can send this location information in the form of latitude and longitude to the requesting user through network and ISP. After getting this location data we can apply Geo-coding to know the exact spatial location in the map.

After knowing our own exact location we have to define some range of communication inside which we want to find our friends. This can provide the boundary to our system to find friends. This is the main feature of our system architecture. We do not want to connect with those friends who are not within our context at particular point of time.

After specifying the range or say fixing the context, our application can find out our friends who use our application and who are now in same context. For this, it searches all the users available in that context. Then it stores this user's friend-list to the database so that user can refer it any time.

After finding the available friends, our application can provide chatting between user and their friends. User only has to select the friend from available friend-list to chat. This chatting service can connect the two different people within same context to share their thoughts. This chatting service can provide more than one friend to chat at the same time.

While providing the chat service we have to monitor the proximity of the user and tell the user which friends are now available in our context. This monitoring feature can remove those friends from friend-list who are not present in our spatial context and add those

friends to friend-list who are newly entered into our spatial context. Through this application can regularly provide the updated friend-list to the user.

5. TAXONOMY CHART

The taxonomy chart given in figure-2, shows the comparison of various existing location based applications. The parameters used here are the services provided by these applications which gives us clear idea of what services are already present and what we should add to the existing systems to make this application a reality.

Functionalities Systems	User location information	Sharing data	User Check-in function	Chatting between users	Proximity specification
FourSquare	✓	✓	✓	✗	✗
GooglePlaces	✓	✓	✓	✗	✗
FullCircle	✓	✓	✗	✓	✗
Gowalla	✓	✓	✓	✗	✗
Loopt	✓	✓	✗	✗	✗

Fig-2: Taxonomy chart showing comparison of various existing social networking system.

6. CONCLUSION

In this paper, we first provide the information about some technologies which are used by people with their pro and cons. Then we provide brief introduction about existing systems. Then we outline several requirements that ideal location-based social networks need to satisfy, and introduced a context-based mobile social networking system. Then we propose our generic framework for constructing design architecture of proposed system.

This application can provide the current location of user as well as their friends who are nearby now. The concept of current context is of utmost important when we are in emergency like quick medical, accidental and other timely help. For instant when we met an accident then friends who are currently available to our nearby place can come for resequence as compare to the friends who are mile and mile away from our current location.

There are so many instances in which our current location is of great significance.

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