Security Based Alert System Using Geo-fencing

Prashant Rai[1],Roma Lakhmani[2],Yadvendra Singh[3],Puneet Varshney[4]

[1]*Student,Information Technology, IMS Engineering College, U.P, India*
[2]*Student,Information Technology, IMS Engineering College, U.P, India*
[3]*Student,Information Technology, IMS Engineering College, U.P, India*
[4]*Ass. Professor,Information Technology, IMS Engineering College, U.P, India*

ABSTRACT

This paper provides the implementation of the concept of geo-fencing in different fields like accidental zones and crime prone zones in a particular area. A geo-fence is a virtual perimeter for a real-world geographic area. A geo-fence could be dynamically generated—as in a radius around a point location, or a geo-fence can be a predefined set of boundaries (such as school zones ,hospital zone,neighbourhood boundaries etc). This application alerts the user whenever it enters the crime prone areas or accidental prone areas. The android application would send notification alerts along with vibration so as to alert the user before entering in any of the predefined crime prone and accidental zones. Crime is unquestionably one of the most prevailing and worrying aspect in our society and all over the world. So the main aspect of this paper is to aware the user of the crime or accidents that take place in an area at right time before any mishappening could take place.

Keyword *: -GPS, Geo-fencing, Alert System, Accidental Records etc….*

---

1. TITLE-

Over the last few decades, many cities around the world have seen alarming increase in the level of crime especially India. Crime in India is very common and in happens in different ways. The Indian Penal Code (IPC) crime rate in 2006 was 167.7 compared to 165.3 in 2005.According to National Crime Records Bureau, the rates were calculated as number of incidents per 100,000 of the population. In 2006, the highest crime rate was reported in Puducherry (447.7) for crimes under Indian Penal Code which is 2.5 times the national crime rate of167.7.

One of the most common and popular proverb "Prevention is better than cure" which reveals that prevention methods are much better to remain away from any problem than finding out solutions to cure that problem. So the core concept of this paper is to provide the user with right information at right place and at right time to avoid any kind of misfortune that is coming.

2.METHODOLOGY

This project integrates the geo-fencing technique and mobile android applications so as to provide the right information to the smartphone user at the right place and at the right time. Geo-fencing technique is used to fence the particular area i.e the areas where accidents happen on a regular basis due to various reasons(like traffic ,merging of roads) and the crime prone areas (like chain snatching) where specific crime occur multiple times. The boundaried will be fenced using softwres like Arcgis,Qgis and Google earth after that the boundaries or the fenced area file will be loaded in the application which will track the user location and notify the user as he/she enters the fenced boundry .

2.1 Geo-fence

A geo-fence is a virtual perimeter for a real-world geographic area. Geo-fence is basically the region delimited by boundaries. Geo-fencing allow an administrator to set up triggerss so when a device enters (or exits) the boundaries defined by the administrator, an alert is issued. Many geo-fencing applications incorporate Google Earth, allowing administrators to define boundaries on top of a satellite view of a specific geographical area. Other applications define boundaries by longitude and latitude or through user-created and Web-based maps.Geofence virtual barriers can be active or passive. Active geofences require an end user to opt-in to location services and a mobile app to be open. Passive geofences are always on; they rely on Wi-Fi and cellular data instead of GPS or RFID and work in the background.

In this geo-fencing technique is used to fence an accidental prone area and crime areas. The accidental records are collected through the concerned police station. A buffer is set in that particular area with an extra of (500 -1000m) such that whenever the user with the mobile application enters in one of these delimited areas an event is triggered. This technique is one of the best technique to alert the user with the right information at the right place and at the right time.

There are many application currently using geo-fencing technique and this one is also among them. There are predefined functions and libraries for creating and monitoring Geofences.

Fig-1   College boundary and blocks fenced.

Fig-2

Accidental locations in the surveyed area

2.2 Creating and Monitoring Geofences

Geofencing combines awareness of the user's current location with awareness of the user's proximity to locations that may be of interest. To mark a location of interest, you specify its latitude and longitude. To adjust the proximity for the location, you add a radius. The latitude, longitude, and radius define a geofence, creating a circular area, or fence, around the location of interest.

You can have multiple active geofences, with a limit of 100 per device user. For each geofence, you can ask Location Services to send you entrance and exit events, or you can specify a duration within the geofence area to wait, or *dwell*, before triggering an event. You can limit the duration of any geofence by specifying an expiration duration in milliseconds. After the geofence expires, Location Services automatically removes it.

You can have multiple active geofences, with a limit of 100 per device user. For each geofence, you can ask Location Services to send you entrance and exit events, or you can specify a duration within the geofence area to wait, or *dwell*, before triggering an event. You can limit the duration of any geofence by specifying an expiration duration in milliseconds. After the geofence expires, Location Services automatically removes it.
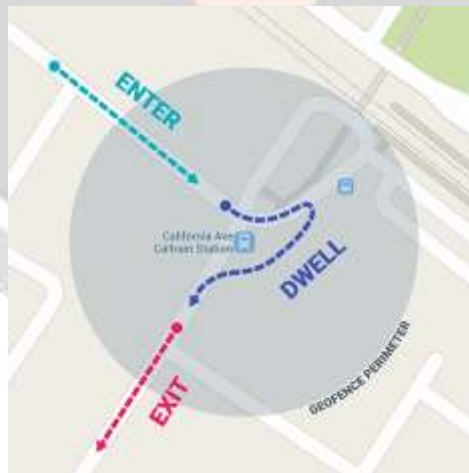

Fig: Depiction of how Geofencing works with application.

3.LITERATURE REVIEW

There are many examples of location based applications that use some sort of geo-fencing techniques to provide information in the right place and even at the right time. They are

[1].”Information Provision Imrovement with a geo-fening Event-Based System”

This project integrate the Geo-fencing technique to Smart city or Smart Campus mobile applications and it will allow users to receive information from their current location . This paper provides the air quality data regarding CO_2 concentration.

[2]. "Enhanced Functionality for Tracing Places ,Weather Forecasting and Geo-fencing using Android"

This paper provides the mobile application to the user in which three technologies are used, Place tracking so as to track nearest places like ATM, petrol pumps, restraunts etc. Next is RTLT –real time location tracking so as to track accurate location of a particular person and last is Geo-fencing.

[3]."**Implementation of Mobile Attendance Application System using Geo-fencing technique**"

This provides the implementation of mobile attendance application using geo-fencing technique to find the exact location of a person using GPS smartphone. The proposed application was developed on the android platform with GPS and Wifi-3G technologies.

[4**].**"**Geo-fencing and Raspberry Pi-based Child tracking System using Smartphones**"

This is a tracking system that includes a go-fencing campus, a child module and a parent module. This paper mainly focusses on the cases where child are kidnapped. Once the child is out of campus message will be sent from child module to parent module.So that the parents could have real time access to their child location .Which would help them to protect their child from any kind of misfortune.

4. CHALLENGES AND LIMITATIONS
The challenge with this project is whether the application would provide the notification at the right time or not.

The limitation with this project is that it requires persistent presence of good internet connectivity as well as GPS for the proper functioning of the application. One more is that it would consume a lot of battery power as both Intrnet and the location services need to be persistently in ON state.

5. EXPECTED RESULT
Our expected result for this project is a smartphone application that would give proper alerts to the user before any kind of misfortune occur so as to avoid accidents by controlling the speed and avoiding any kind of rash driving in the fenced area or be a victim of any kind of criminal activity in the predefined zone.

6. CONCLUSION
This paper provide application using geo-fencing techniques. In our project the event is to send notification to the user mobile device when they enter accidental prone areas or crime areas. This is done with the help of geo-fencing technique and implementing the fenced boundry as a database with the application to produce exact result that we want.It helps to integrate data with the application . The accidental areas and crime areas are fenced using geo-fencing technique. So this project integrates the geo-fencing data with android mobile application.

7. ACKNOWLDGEMENT

8. REFERENCES
[**1**]. Information Provision Imrovement with a geo-fening Event-Based System.

[**2**]. Enhanced Functionality for Tracing Places ,Weather Forecasting and Geo-fencing using Android.

[**3**]. Ravindra B. Sathe and A.S. Bhide "GPS-based soldier tracking and health monitoring system"World Journal of Science and Technology 2012, 2(4):97-99 ISSN: 2231 – 2587

[**4**]. VChadil, N.; Russameesawang, A.; Keeratiwintakorn, P., "Real-time tracking management system using GPS, GPRS and Google earth," Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology, 2008. ECTI-CON 2008. 5th International Conference , pp.393,396, 14-17 May 2008