Crime Mitigation Using Geofencing

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Abstract- *Now-a-days many people fall victims at the hands of crimes such as kidnapping, chain snatching, eve teasing, child abuse etc. We have designed an android application which is useful for monitoring crime. However, the this new solutions for public safety requires concepts based on information and resource sharing. Sharing information between services allows acquiring more knowledge about the current events of the crime prone area that helps participants make informed decision. We have created Geo-fences that will help user to be alert in the restricted area which is made by the admin manually inside the app. The latitude and longitude of the Geo-fences are stored on server whereas the entire user data is stored in the database. Later we access these data from server to our mobile app by using this application.*

*Keywords*- Geofence, Location based tracking, monitoring, android.

I. INTRODUCTION

Rapid growth in globalisation has caused crime to become a common phenomenon and a social problem. Government as well as the law enforcement agencies do their best to make changes with the prespective of crime reduction. Crime is a serious offence which the government wishes to prevent and upon conviction is punished in front of the eyes of law.

In this work, an app is designed which provides a co-operative platform based on geofence that has the ability to work with different systems and that can help monitor and prevent crime.

Geo-fencing

Geo-fencing uses Global Positioning System or Radio frequencing identification technology to create a virtual geographic boundary called geofence, which enables the software to generate a response when a mobile device enters or leaves a particular area. Geo-fencing technique is executed on the smart phones. Here the current location of the user is continuously tracked through GPS to keep track of their respective distances from the fenced area. The mobile device is considered as client which is responsible to locate itself. The distance between the device and the defined coordinates of

particular area is measured using the Euclidean distance formula.
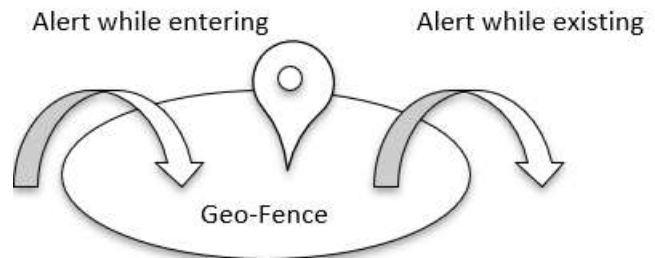
Geo-notification is purely location based notification. So as the user enters or crosses the boundary of geographical region he/she will be notified immediately in the form of a popup on the screen (if the app is opened) or via notification with a vibration.

For example, it can be used to:

- Notify a consumer as they enter a shopping centre that an office supply store's back-to-school sale will end in two hours.
- Send tourists brief description of the places they can visit in the vincinity of the place they have entered.
- Communicate the current event of venue to fair-goers, which they were approaching.
- Notify driver who enters a particular section of highway about the construction, etc, causing traffic and that they should take a different way towards the destination.
- Alert drivers that there is a severe fog condition ahead and they should reduce speed immediately.
- Send a message to all subscribers in a particular area that their water supply will be cut off in half an hour to replace a section of pipe.

Our system delivers risk information timely to specific users who are in the area where a crime has occurred or may occur with high probability. We assume that each user has a smart phone with position detection system i.e GPS and Internet connection capabilities. Because the users usually carry their smart phones with them all time, they can conveniently acquire information.

III. FUNCTIONALITY

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, kidnapping) where specific crime occurs multiple times.

The boundaries is fenced using Google maps after that the boundaries or the fenced area coordinates will be loaded in the application which will track the user location and notify the user as he/she enters the fenced boundary.

IV. METHODS AND MATERIAL

A. Client Server Architecture

We are working as client-server based application where android device is client and PHP server is server side. The complete database is store on the server, user retrieve it in his/her device anytime and anywhere until the device is connected to internet.

Data is store in JSON format alternative to XML. There are two methods for posting information on the web in PHP.

(1) Get :- Get method is default set in PHP language. This method allows whatever data you are giving as an input, in browser URL.
(2) Post :- hile post method cannot display any input inside the URL.

Mobile   Internet
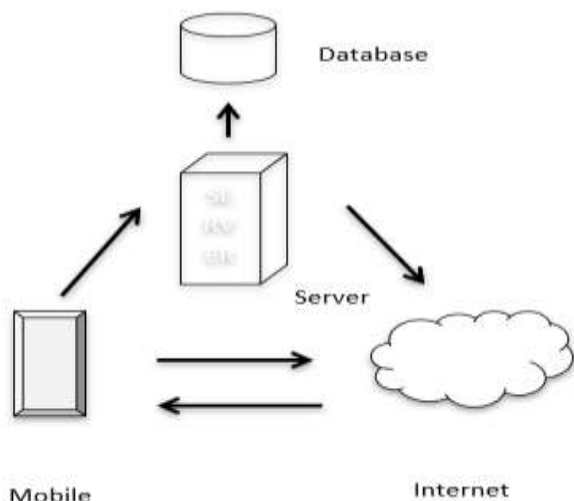
B. Server Operation

Programming is mainly created for android mobile which will act as client. Our app runs on android mobile. The data of android mobile will be sent to PHP server and later fetch the data from PHP server to android devices in the form of JSON.

V. RESULTS

Client Activity

We are sending notification on client device by as a notification alert or a pop up when the app is opened. This notification is send to the users whenever the user is in the 5 km vincity of the geofence co-ordinate. There may be multiple geofence defined in the area however only the geofence which is closest to the mobile location is visible inside the application.
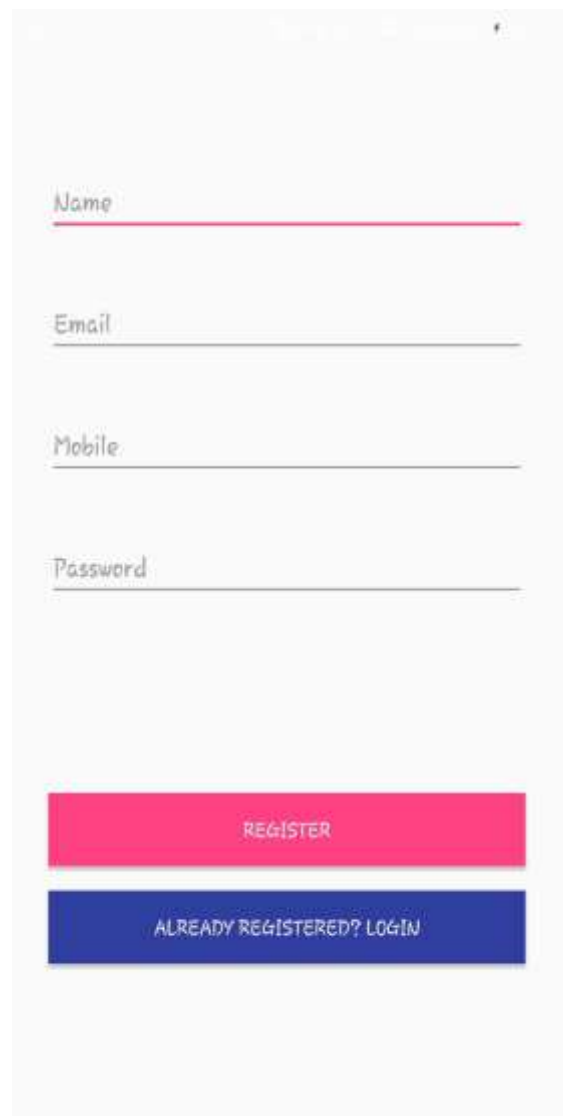

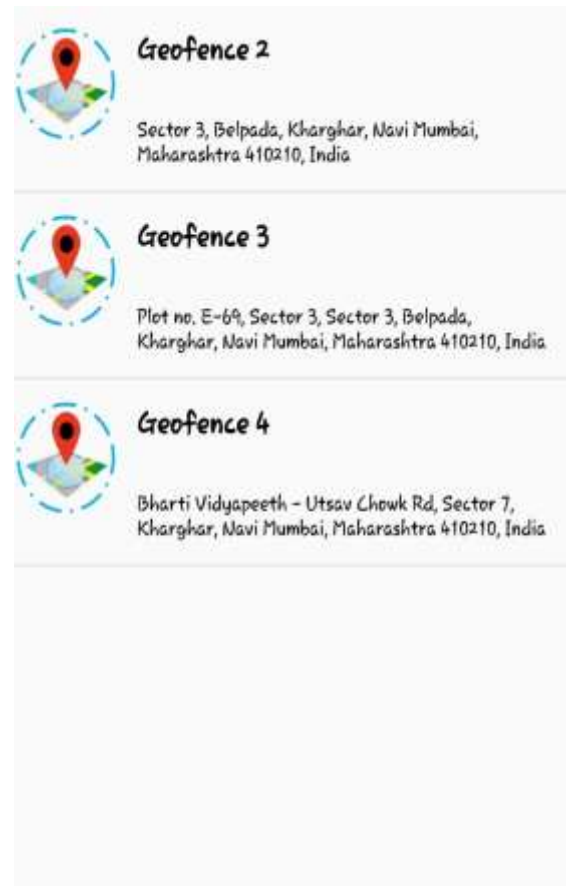Fig. 1. New user registration

Fig. 3. Add Geo-fences
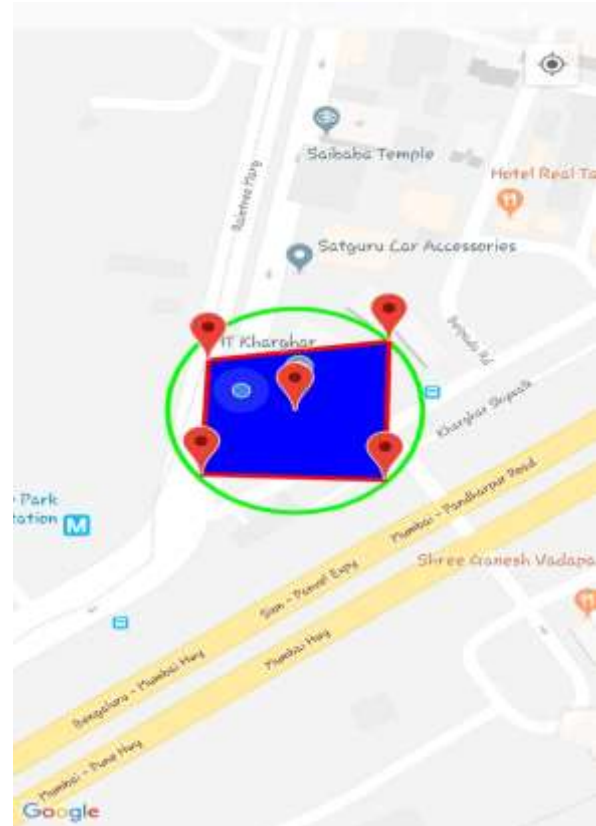

Fig. 4 . View Geo-fences

Fig. 2. User Login

Fig. 5 . Defining Geofence

VI. NOTIFICATION ALERTNESS

Our application has the following features:

- Provides facility to create a fence on particular area if the admin finds it to be crime prone.
- User can save information about specific area and can use it when needed.
- Informing users by giving notification when they enter a restricted area before he/she crosses boundaries.
- We are likely to provide the facility for user to navigate to a safer place, when he/she is closer to crime prone area.

VII. CONCLUSION

The need to find more effective technology for crime mitigation has been discussed. As the IT is increasingly used to automate the processes, this research has presented an overview of a proposed IT-based approach for crime mitigation by using geofencing to achieve better results. By conducting this research, there will be solution for more effective and efficient way to spread information, direct, and monitor community in crime-prone areas.

REFERENCES

[1] Suyama and U. Inoue, "Using geofencing for a disaster information system," 2016 IEEE/ACIS 15th Int. Conf. Comput. Inf. Sci. ICIS 2016 - Proc., 2016.

[2] N. Kumar, "Emergency Information System Architecture for Disaster Management : Metro City Perspective," vol. 8, no. 5, pp. 560–564, 2017.

[3] N. R. Council and others, Improving disaster management: the role of IT in mitigation, preparedness, response, and recovery. National Academies Press, 2007.

[4] S. P. Raflesia, D. Lestarini, and A. C. Abuse, "Geofencing Based Technology Towards Child Abuse Prevention," pp. 4–6.

[5] Jad Helmy ; Ahmed Helmy,"Alzimio: A mobile app with geofencing, activity-recognition and safety features for dementia patients" 2017 IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS).

[6] P. Szczytowski, "Geo-fencing based disaster management services," Agent Technol. Intell. Mob. Serv. Smart Soc., pp. 11–21, 2015.

[7] Android Developers, "Creating and Monitoring Geofences," http://developer.android.com/training/location/geofencing.html.