COMPANY ENTRANCE SURVEILLANCE SYSTEM

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ABSTRACT

Company Entrance Surveillance System tracks the visitor in defining the space. Data is the most crucial element in the technology era. Security of valuable data is one of the important aspects. Tracking becomes one of the most effective and advanced way to enhance security of the firm. Tracking of a person or more specifically the tracking of visitor in the area where reliability is important and vulnerable to unwanted activities like stealing the confidential data, leaking or destroying it. Company Entrance Surveillance System works under the range of Wireless Fidelity (Wi-Fi) and fetch the location of visitors in the form of latitude and longitude repeatedly over a period of time. The system is cost efficient and highly effective in terms of security and maintenance.

KEYWORDS: Tracking, Security, Visitor, GPS (Global Positioning System), WI-FI (Wireless Fidelity), IP (Internet Protocol)

INTRODUCTION

Any company acquires a large amount of confidential data. Security is a valuable concept in terms of protecting data. Numbers of visitors come to company for different purposes. A visitor may come to the company with the purpose of burglary (theft) or steal/leak the data. It is important to keep watch on the visitor and his/her activities. Now-a-days tracking is the most efficient and popular way to intensify and protect the essential data of any firm. Numerous methods are available for tracking such as RFID (Radio Frequency Identifier), GPS system, Geolocation, LBS etc. The applications of these techniques are increasing day-by-day.

PROPOSED METHODOLOGY

Some people come as a visitor for stealing company's confidential data or for doing some kind of crime. The system will show the location of visitor for dealing with such situation. For showing the location of the visitor, the system needs central Wi-Fi and one android mobile handset with visitor connected with same central Wi-Fi. After such setup, the system will get two attributes of location from android mobile handsets that are Latitude and Longitude. The system uses Google map APIs for showing Latitude and Longitude on map. The system automatically fetches the Latitude and Longitude after every particular timestamp for getting accurate location.

Steps for the Working

- Connect the visitor's smart phone with the central Wi-Fi of the company.

- Turn On the location of visitor's smart phone.

- Enter the IP address of central Wi-Fi and Visitor's unique Id in the Tracker Android Application.

- Click on the button "Start Tracking".

- The android application will send Geolocation (Latitude (X) and Longitude (Y)) of the visitor to a server.

- The system will fetch the Geolocation (Latitude (X) and Longitude (Y)) from the server.

- After every small timestamp the android application will send the latest Geolocation of the visitor to a server.

As shown in Figure 1 the time visitor comes to the company, at entrance gatekeeper verifies him/her and visitor has to connect to the company's central Wi-Fi by turning ON mobile hotspot and thus the smart phone of visitor connects to the company's central Wi-Fi. After that the IP address and Visitor Id is entered in "Tracker" Android application as shown in Figure3. The visitor has to turn ON the location of smart phone. After entering into the company, the smart phone of visitor sends the Geolocation (Latitude (X) and Longitude (Y)) to the server of the company. At least the server sends the location to the system of surveillance.

As shown in Figure2 Geolocation of visitor's smart phone is received by the system over a very small period of time such as 5000 ms (milliseconds). The value of Latitude (X) and Longitude (Y) updated and stored in the system. The system stores the last location of the visitor.

As shown in Figure3 Android Application – Tracker is used to track the activities of visitors. The application contains two simple fields, i.e. IP Address and Visitor ID which has to be entered and click on the button "Start Tracking". So, the process of tracking will be started.
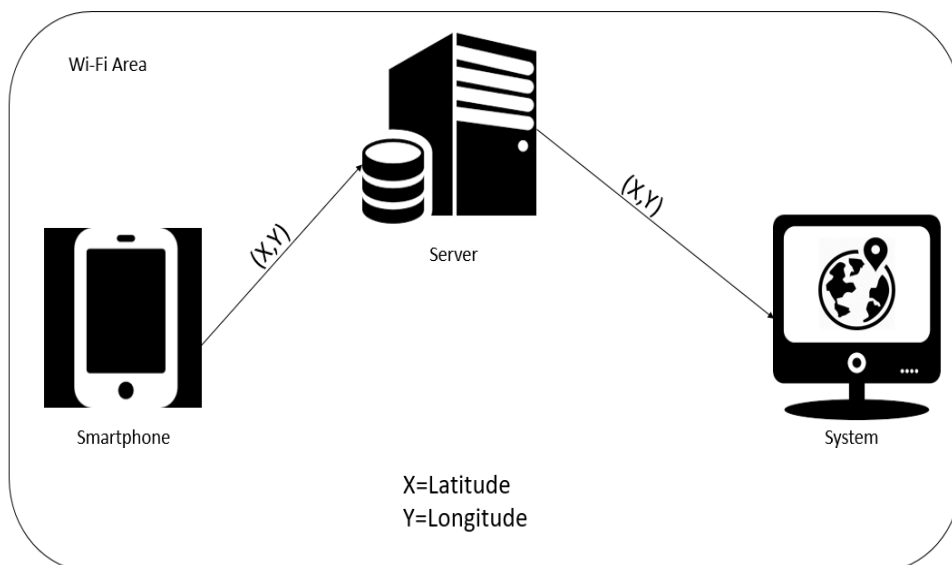

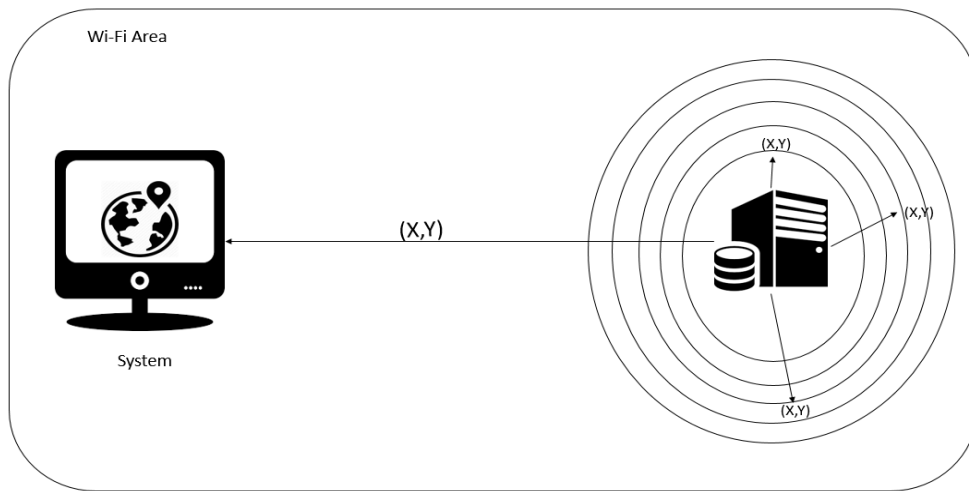**Figure 1: Smartphone sends the Geolocation to System**

Figure 2: Smartphone Repeatedly Sends Geolocation to System over a Small Period of Time
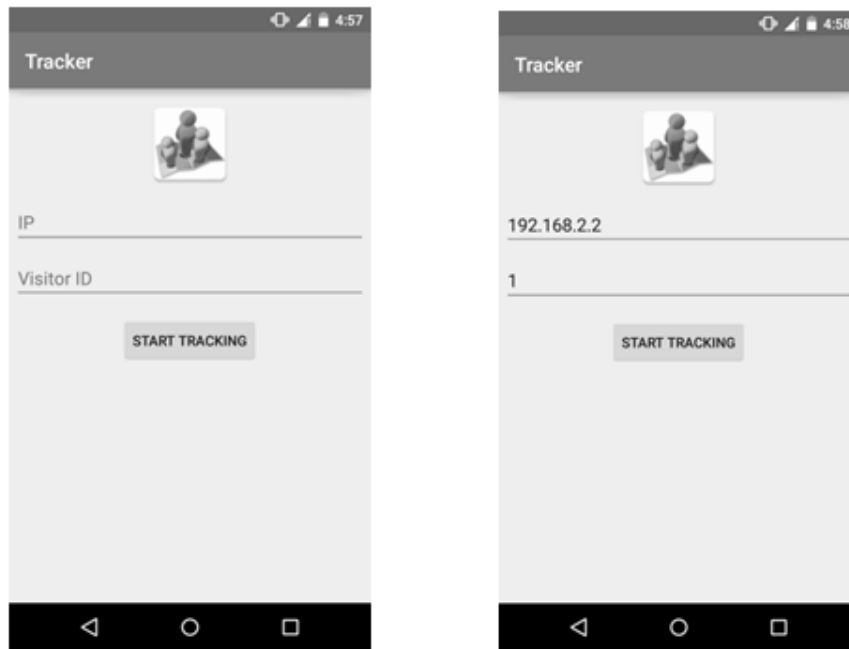

Figure 2: Android Application – Tracker

ANALYSIS AND RESULTS

From the different types of tracking techniques we have opted Geolocation technique. Because this one is low in cost and easy to operate and maintain. Company Entrance Surveillance System's accuracy is based on the strength of the Wi-Fi signals and speed of the internet. If the range of the signals is high, then it will give more accurate results and lower strength signal of Wi-Fi will give less accurate result. We have analyzed this by doing the same operation in different signal strength as shown in Figure4, which describes the difference in between two results via 4 (a) and 4 (b). The low speed of the internet tends to the variation in the same output.

	Visitor ID	latitude	longitude
Map	1	22.321295	73.233245

Figure (a): Accurate Result

	Visitor ID	latitude	longitude
Map	1	22.3213583	73.23313

Figure (b): Inaccurate Result

Figure 4: Variation in Result Due to Speed of Internet or Strength of Signal

As shown in Figure 4(a) which is accurate result of the location. This accurate result was obtained when the speed of the internet was high. The location shown in the map is an accurate one.

As shown in Figure 4(b) which is an inaccurate result received in the circumference of low speed internet. So, the location shown in figure was less accurate.

The final result of the system will in terms of Latitude (X) and Longitude (Y) i.e. Geolocation of the person where he/she goes. The Geolocation of many visitors in the company can be seen at a same time. The map from the Google map API can be seen by clicking on the Map. After every 5 seconds the output changes as the visitor roaming in the company and the system gets the current location of the visitor. So, this system can keep an eye on the visitor's activity through tracking.

The "Tracking" Android application starts tracking after it shows the toast message on the screen as shown in Figure 5.

Figure 5: Tracker Application Gives the Toast Message

As shown in Figure 5, firstly after clicking on "Start Tracking" button, the screen will show one toast message "Get Location Status". Then after fetching the location of the visitor's smart phone the system gets the position of a visitor as Latitude and Longitude when Screen shows the toast message "1". Every time after 5 second, the location updates and again, these toasts appears on the screen and the values are updated.

At the last the final result will be as shown in Figure 6.

Figure 6: Final Result

CONCLUSION

The Company Entrance Surveillance System is shielding system for companies to increase the level of safety and security of big premises company by threats of unwanted visitor or other criminal activity. Furthermore the technique used for visitor tracking – the Geolocation method is low in terms of cost and highly accurate. Also the maintenance and operation of the system is very simple so it is user friendly. So, this proposed system enhances the level of security of big premises company with less investment and large profit.

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