

# An Efficient Tracking of Human and Vehicle Based on GPS and Geo-sensor Using Mobile Devices

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**Abstract**— few year ago, it was not possible to track the position/location of human being as very less people were using handheld devices, smartphones. In the existing system fetching current location information i.e. latitude and longitude was not more accurate and when GPS is off in handheld devices then the location tracking will also stop and fetching the location information from cloud or server having a more overhead. So all these drawbacks will overcome in our proposed system. The main goal of our proposed system is to develop an efficient location based tracking system using Geo-racker and algorithms for finding the exact position of human and using the Geo-sensor to find the vehicle position through the GPS. Geo-Sensors are used to track exact latitude and longitude information to find the vehicle location. This system operate by using android application in android devices. When the user are offline the android application capable to shrink the current location and store in local database. The android application is used for report generation and that having above 90% accuracy as compare to existing system.

**Keywords**— GPS, Geo-tracker, Geo-sensor, android.

## I. INTRODUCTION

Nowadays, huge number of users uses the smartphones equipped by a GPS receiver increases rapidly, while increasing their interest for mobile applications that enable the storage space, analysis and visualization of the collected location information are more feasible. The major development and progress in mobile computing have led to a lot of services and functions which are available for users. The outdoor location-based services associated with GPS and Geo-tracker. Mobile computing plays an important role that deals with interaction between computing devices, which include mobile hardware and software, mobile communication. Mobile assets play an important task in tracking the human current location of the human and precisely manage their routing and the Geo-sensor can track the vehicle location information in the form of latitude and longitude.

The detection of indoor location asset may be active or it may be passive in that where active detection manual interaction will not needed to send their data whereas passive detection it needs to store all the tracking information in their device memory.

The outdoor positioning system will covers the location outside the building while during travelling or driving long distance coverage. Smart mobile devices are need to perform a multiple tasks. That tasks are operated by sophisticated geographical location which increase the mobile user experience through a mobile applications. The three main assets involved in human tracking system are as follows:

- a) *Rules*: It is a conditions or some restrictions that set for monitoring the behavior of user or agent. This behavioral specifications that are included on every computing device. Rule contain set of actions that are perform life time of event and it also having some triggering events.
- b) *Location awareness*: Determining the location in a network by using the mobile node and navigational instruments (NI) that calculates location information i.e. the latitude and longitude coordinates. If any change in the location and configuration information then it will provide notification to user or mobile agent.
- c) *Context awareness*: It will increases the entities behavior that are easier and sophisticated for their users.

Within the limited resources of mobile device and communication system it is capable of dealing with dynamically changing environment and smartly exploits the context information

## II. LITERATURE SURVEY

Development of proposed system some of the papers are we will referred regarding to GPS that major assets are discussed below:

**Jie Tian, Yongyao Jiang, Yuqi Chen, Wenjun Li, Nan Mu.** "Automated Human Mobility Mode Detection Based on GPS Tracking Data." IEEE (2015) [1]. This paper will detect the human location using human mobility using GPS. This paper study intends to design an efficient detection of hunam mobility based on GPS that is are easy to understand and to further development of system.

The rule-based empirical approach is proposed to segment a person's daily working activities and that subdivided into the five different detection modes and to detect them by analyzing the duration of time, geographic location, speed as well as spatial context information in the data. An application has also been developed to facilitate the use of our proposed approach by others.

**Balakrishnan, P. Padmavathy & C. "An energy efficient tracking of human mobility and event based on WPS using android technology."** International Journal of Advanced Computational Engineering and Networking (2013) [2]. This paper mainly focuses on human tracking management and this management are done by the smart phones by the utilization of techniques like GPS, WPS and service set identifier (SSID). In human and vehicle tracking approach to track mobile assets plays an important in day-to-day life in this approach involves the areas of tracking such as vehicle and employee tracking. The motivation is to develop such mobile application for the diversity involved in interconnected devices in the network, cellular applications and GPS – aware environments. Some of the asset of tracking systems does not enable context utilization because wireless data transmission are inefficient and the data transmission rate are high due to the data rates. To forward location information, fixed data flow technique uses more resources than the actual resources required.

**Xiaoli Wang, Albert Kai-sum wong, Yongping Kong. "Mobility tracking using GPS,Wi-Fi and cell ID."** IEEE (2012) [3]. In this paper, we will firstly introduce about mobility map and the offline data processing during learning. Then we will discuss the state transition diagram in online tracking of data reconstruction. The mobility map (MMAP) model that we use in online mobility tracking. The MMAP is made up of location points that are derived from clustering of human's historical data information.

### III. PROPOSED SYSTEM

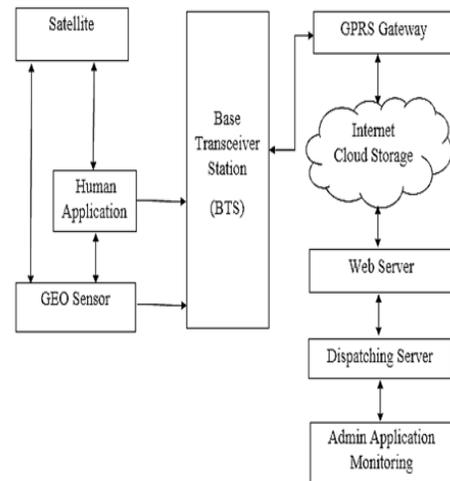
This paper proposes the efficient human and vehicle tracking system. The user location information are track by the admin application in form of location information. The essential components included in human and vehicle tracking are as follows:

- 1) GPS satellite tracker.
- 2) Geo-sensor.
- 3) GSM service provider.
- 4) Android phones.

All this components are involved in the human and vehicle tracking system. The GPS satellite tracker is a device which is mainly used by Global Positioning System (GPS) [1] that sends the data to mobile device.

For tracking the human and vehicle location information the Android phone are used to track the current location information with the help of GPS. These android mobile offers many more smart features regarding location tracking such as GPS, location sharing, Google Maps for private home networks in given environment. GSM service provider used to track the mobile location and the Geo-sensor track the vehicle information and events triggers during the mobile usage. We decided to store information in a cloud in order to avoid requiring Internet connection at some situation. For this purpose, we make use of the local database in mobile device. Which is embedded on the Android SDK. The database is a simple schema that contains the main information of a track, the GPS coordinates. The weaker signals due to GPS [5] are overcome by Wi-Fi Positioning System (WPS) [2]. The block diagram shows the flow of human and vehicle tracking system.

From figure it will clearly shows the flow of human and vehicle tracking some of assets are discuss as follow:



**Figure 3.1: System block diagram**

From figure it will clearly shows the flow of human and vehicle tracking some of assets are discuss as follow:

#### A. Global positioning system

The GPS system is based on space satellite navigation. It contains some assets like satellite, control and monitor stations and receivers. The vital role of the GPS receiver is that it calculates the coordinates by precisely timing the signals which are transfer by GPS satellites.

### B. Geo tracker

It helps to broadcast the location information and finds the time interval between the previous and current location of human.

### C. User Interface

User interface acts space where the interaction between the user and the mobile devices. UI will provides an effective control and operation of the mobile device to the end-user. Here the Geo tracker [2] utilizes the GPS for tracking the human locations by estimating the location points in the form of latitude and longitude but in some cases the GPS faces the problem due to weaker signal or environmental impact, the WPS [2] system helps to overcome the problem in location tracking.

## IV. ALGORITHMS

In human and vehicle location tracking system uses different algorithm that depends on the awareness of the user that are discuss below:

### A. Static interval algorithm

This algorithm are derived from the functionality of GPS. As its algorithm name describes the data transfer to centralized cloud after every fixed time of interval. It uses two variables; first is to keep track of change in time and second for the frequency. The important functionality of this static interval algorithm is that it keeps on reporting the last point location and the next point of location. This algorithm will follows the following steps:

- 1) Mobile device acquire GPS via satellite or geo sensor that installed at vehicle.
- 2) If network is available it sends to tracking control center then to cloud via internet.
- 3) The parent will see the location information reported to mobile device.
- 4) If it require continuous tracking then then it will again start from step 1.

### B. Radius based distance algorithm

It related with the distance points between the traced human locations. It deals with points locations which are within the radius from the mobile device. It calculates the distance between the previous location point and the current location point of the mobile device and sends the alert notification to the cloud and to the admin mobile device. When the user moves out of the geographical zone. The flow of algorithm reports the current change in the direction of the mobile device. The radius based distance algorithm follows following steps:

- 1) The base station will receives the location from satellite.
- 2) The GPS receiver at base station having GPS receiver to send the location information to transmission antenna via receiver
- 3) Ay project point called rover that will changes the correction point between the project point and antenna.

### C. Speed algorithm

This speed algorithm reports the change in speed in the mobile device. The changes made in speed then it will change results in frequency of the data sent to the cloud. The speed algorithm involves the current speed and last speed, low and high interval variables. The predefined speed is compared with last speed report to calculate the threshold value. When the speed is high, the data rate transmission is high where as in lows peed data rate is low in transmission. Adjustment of data update interval when the counter reaches the threshold level. Speed algorithm manage the following steps in tracking process:

- 1) The speed algorithm manage two points  $E_i$  and  $O_i$  i.e. epicenter and observation point.
- 2)  $E_i$  and  $O_i$  points detected at every tracking point location.
- 3) Depending on that it will detect the tracking location at run time.

### D. Event tracing algorithm

In this algorithm we utilize a context distributed approach. This algorithm is based on target requirements of user location, we utilize geographically predefined characteristics in the form of context profiles that will increase the transparency while monitoring the context from the device by the use of timestamps. Timestamps will use group the characters which describes the action that as occurred in the mobile device. The GPS location tracking in given algorithm follows following steps:

- 1) Track the location at initial point of human or vehicle.
- 2) If turn is detected then switch GPS one till its first successful lock and then off.
- 3) If  $T_{OFF} > T_{DC}$  then location is estimated otherwise follow step 2.
- 4) Report the location to the system.
- 5) Stop tracking or start it from new location.

## V. CONCLUSION

The tracking of human awareness system is a real time monitoring application that allows the parent to monitor their child location.

It will track the child location using android mobile devices. The aim of this paper to make use of mobile devices that integrates with the enhance GPS of geo tracking and Geo sensor services by using the utilization of satellite space for estimating the accurate current location learning approach that will increase the accuracy of tracking human location and conserving valuable mobile devices that asset utilization. The main contribution of the development of application is to protect the user from unwanted practices and user activity.

#### REFERENCES

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