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Informative Indoor Tracking

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Abstract: **Wireless location finding is one of the key technologies for wireless sensor networks. GPS is the technology used but it can be used for the outdoor location. When we deal with the indoor locations GPS does not work. Indoor locations include buildings like supermarkets, big malls, parking, universities, and locations under the same roof. In these areas the accuracy of the GPS location is greatly reduced. Location showed on the map in not correct when the GPS is used under the indoor environments. But for the indoor localization it requires the higher accuracy sp GPS is not feasible for the current view. And also when the GPS is used in the mobile device it consumes a lot of the mobile battery to run the application which causes the drainage of the mobile battery within some hours. So to find out the accurate location for indoor environment we use the RSSI based trilateral localization algorithm. The algorithm has the low cost and the algorithm does not require any additional hardware support and moreover the algorithm is easy to understand. The algorithm consumes very less battery as compared to the battery consumption of the GPS. Because of these this algorithm has become the mainstream localization algorithm in the wireless sensor networks. With the development of the wireless sensor networks and the smart devices the WIFI access points are also increasing. The mobile smart devices detects three or more known WIFI hotspots positions. And using the values from the WIFI routers it calculates the current location of the mobile device. In this paper we have proposed a system so that we can find out the exact location of the mobile device under the indoor environment and can navigate to the destination using the navigation function and also can enable the low consumption of the smart mobile battery for the tracking purpose.**

Goals:

1. **Useful at the places where GPS cannot work**
2. **Reduces the battery consumption**
3. **Routers are used.**
4. **Provides the path as well as the information of the location as per the requirement of user.**

Keywords: **Indoor Localization Algorithm, RSSI-based, WIFI Access Point, Smart Phones, Android, Accelerometer Sensor, Orientation sensors.**

1. INTRODUCTION

The communications is currently the major driving force of the development of several indoor location services for wide range of applications such as those in commercial, agriculture, medical, and the military uses. Various wireless technologies can be employed for indoor positioning applications. Some systems make use of an existing wireless network infrastructure such as Wi-Fi. More flexible and efficient systems employ IEEE 802.15.4 Wireless Sensor Networks (WSNs) due to the advantages in term of low power consumption, light weight and low cost. Existing indoor localization systems can be classified into three types based on the structure of service areas. These include the indoor localization systems for two-dimensional service areas, three-dimensional service areas, and multi-story building. Most of existing systems are designed for usages in two-dimensional areas where the position of target object is specified by a coordinate (x, y). The second type of the indoor positioning system considers a three-dimensional space in a small service area, such as in a room. The state of the object location is derived in the form of coordinate (x, y, z). Lastly, the positioning systems designed for the indoor multi story building need to specify not only coordinate (x, y) in two-dimensional plane but also the floor where the object is Located. Compared with outdoor localization, the difficulty of indoor localization lies in that indoor maps pay more attention to small areas, large-scale, high precision and subtly

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display of the internal elements. Along with the rapid development of wireless net- works and smart phones, the number of WIFI access points increase dramatically and most WIFI access points locations are fixed. This phenomenon suggests a new direction for indoor localization research in wireless sensor network. Existing wireless localization algorithms require either special hardware support or complex computing, which consuming valuable battery resources greatly, especially comes to smart phones or sensors. The contribution of this paper is that it proposed a new algorithm which increases the indoor localization accuracy without any additional hardware support or increasing the computational complexity.

Functionality: 1 Map

2 Databases

3 Wifi Routers

II. LITERATURE REVIEW

In existing system,the coverage areas of GPS are still limited that is GPS cannot function indoor and also causes the complete battery drain. In Proposed system, we are developing one platform where we can detect location at indoor environment along with the detection of the destination we provide the detailed idea about it, that is information about a particular destination is provided with less power consumption.

III. EXISTING SYSTEM

Nowadays, as smartphones 1 are becoming more and more powerful, applications providing location based services have been increasingly popular. Many, if not all, smartphones are equipped with a powerful sensor set (GPS, WiFi, the acceleration sensor, the orientation sensor, etc.), which makes them capable of accomplishing complicated tasks. Unfortunately, as the core enabler of most location tracking applications on smartphones, GPS incurs an unacceptable energy cost that can cause the complete battery drain within a few hours. Although GPS is often preferred over its alternatives, the coverage areas of GPS are still limited (GPS typically cannot function indoors). To this end, our goal in this paper is to improve the energy-efficiency of traditional location tracking service as well as to expand its coverage areas

IV. OBJECTIVE AND SCOPE

- The system will work in real time.
- A system which can track the indoor location and can show the navigation of the path with less consumption of battery.
- This system enables us to track the location of GPS isolated areas and get the complete path of navigation.
- The system also provides the relevant information of the area and also maintains user's database.

V. METHODOLOGY

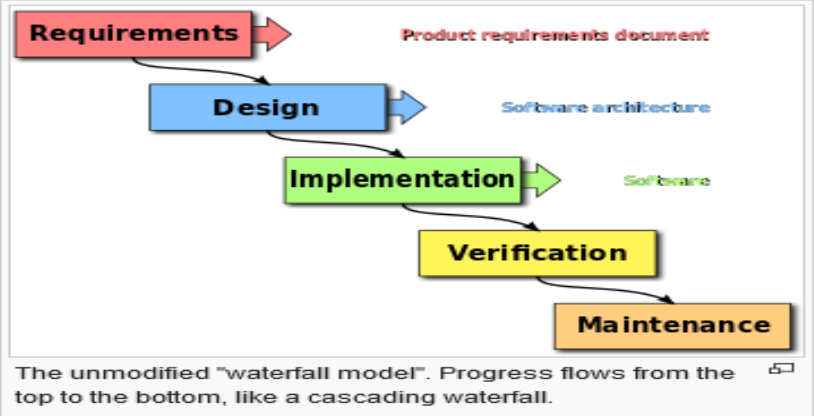

Figure1. Methodology

Waterfall Model is a sequential design process used in software development process in which process is seen as flowing steadily downward(like waterfall).

Through the conception, initiation, analysis, design, construction, testing, production/implementation and maintenance.

Proposed system:

In the indoor environment with each WIFI routers there are some attributes. In our system we will be using the strength that is the level and the frequency for the calculation of the distance of the mobile from the WIFI routers. But as we are dealing with the accurate location finding and also less consumption of the battery we take the assistance from the mobile sensors. The smart mobile has the number of the sensors embedded within it. But for our system we use the accelerometer and the orientation sensors. We calculate the distance value to plot the mobile device location and to check whether the user is moving to check speed and the path change we take the sensor values. The location found will provide detailed information. On detecting a store at any mall it will provide information of the store to irregular customers and recommend to the regular customers, inorder to provide information to the customers the store will create a database of the customers.

VI. CONCLUSION

This paper provides technique for indoor tracking using the WIFI routers. The Smartphone sensors accelerometer and the orientation sensors are also used to find out the accurate location of the smart mobile, by providing information about the location. And also maintains the database of the customers. These techniques don't require any additional hardware and as the sensors require very less battery consumption than the GPS it can be used to save the battery life.

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