

Android App for Creating a Map of the College to be used with Visitor Localization

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Abstract - A university campus may be very large or it may have many campuses and routes. It creates problem to visitor to reach easily and timely to their desired location. So, there must be a system that will guide and help visitor and also students to get to their desired places from their current location. Almost all people including students uses smartphones. So a map application will be most helpful to locate desired place and shortest path from current location.

Key Words: UWB i.e.UltraWide Band, Android app, map, Navigation, Current location, Destination.

1. INTRODUCTION

As we all face problems while visiting in new campus as we are not familiar with the infrastructure of the campus. There are no facilities to find places like administrative building, departments, library, canteen, etc. in the campus and how to find those places from current location. The new faculty members, staff and visitors also face same problem inside campus.

To avoid all these problems college or organization should provide a solution for this. So, mobile application is the best solution for this problem. Therefore, maps are the best way to provide locations. Mobile application may be used along with integrated map of the campus. The best way to get indoor map is UWB i.e. Ultra WideBand. Application will be integrated with UWB to get current location.

UWB is one of the most recent, accurate and promising technologies. The precursor technology of UWB is referred to as a base-band, impulse and carrier-free technology. UWB technology is used for indoor positioning applications. The application works with coordination with UWB in live environment to get places as per visitor's need. To provide users with location information a location tracking system need to be build. It helps to get current location and guide or navigate visitor to reach their destination. This mobile application based on UWB will help visitor to explore the campus.

Application will locate the visitor and will guide the direction to reach to their desired destination. UWB will get the current location of the visitor. The data of visitor along with their location will be stored at the UWB's server. Mobile application will fetch the visitor's data

from the server and will locate the visitor. This will help visitor to get their exact location. It will also navigate the visitor and will give the shortest path to reach their destination place from their current location. UWB based indoor mobile application is the best solution to get over the searching problems faced by visitors in the campus. UWB API is needed to created a mobile application to get accurate result. Different searching algorithms are used to get the shortest path while navigation. Such applications are now in demand and are becoming a part of campus environment.

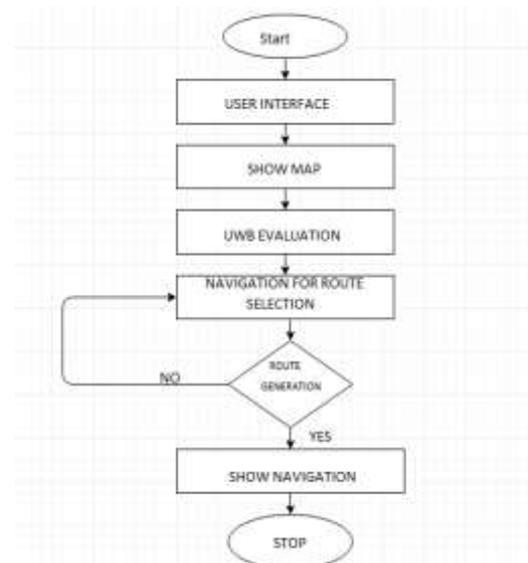


Fig-1: Process Diagram

In our project we are going to use UWB because from our literature survey we can say that it is the most accurate and promising technology. It is a communication channel that spreads the information or data over a wide range of frequency spectrum because it occupies portion of the frequency spectrum that is greater than 20% of carrier frequency.

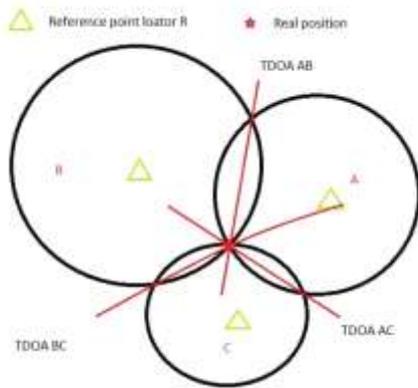


Fig-2: TDOA Algorithm

TDOA algorithm returns the real time location of user. TDOA is a localization technique which helps to get user their current location. This algorithm is the difference in time interval between the signal's arrival at multiple nodes. The time difference are located to intersect multiple curve area. This positioning algorithm includes two types of dimension spaces i.e. 2-Dimensional space and 3-Dimensional space. 2-D space includes atleast three reference nodes of the curve area. And in 3-D space there are four reference nodes.

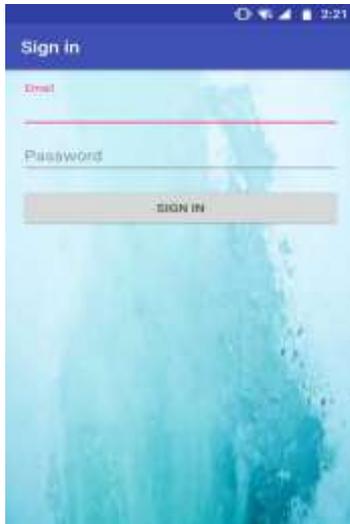


Fig-3: App Page(Sign in)

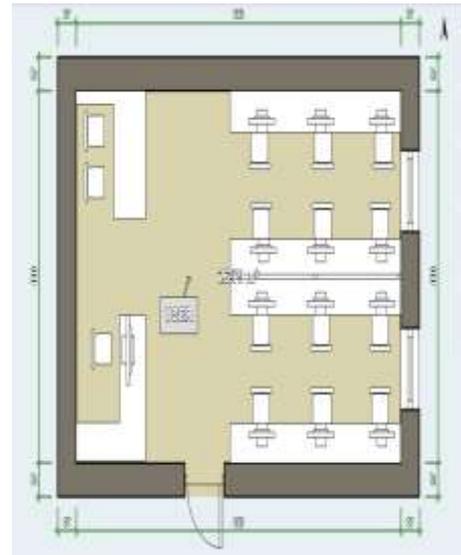


Fig-4: Map added in the app

3. CONCLUSIONS

In this paper, we present our study on UWB positioning and how we developed an navigating app using UWB. In this, we provide map that is easy to integrate into any mobile application or other visitors using our Ultra Wideband APIs. These application works with co-ordination with UWB in real-time environment to keep track of the places and points. This also provides users with location based information a location tracking algorithm based on wireless network signals is created, which determines the geographical position inside buildings.

By using this android application visitors can able to localize or get able to navigate the places of the college campus like class rooms, library, labs, offices of HODs of different departments, exam centre ,etc. This application also navigates the direction that you wish to visit.

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