

# 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 use smart phones. So a map application will be most helpful to locate desired place and shortest path from current location.**

## 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 issued for indoor positioning applications. The application works with co-ordination 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 create 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.

## 2. LITERATURESURVEY

In [1], they have used way finding system that could show faculty, staff and student. In [2], they have used Bluetooth technology which is low power consumption compared to any otherdevice. In this paper result show 2 meter median accuracy is achieved. [3] Present UWB (ultra wide band) indoor positioning that has shows better performance. In this paper UWB technology is implemented using a multiple-mode resonator (MMR). In this paper that aim is transmitting the signals in whole UWB. Pass band of 3.1-10.6GHz. In [4] Wi-Fi and Smartphone based positioning technology play important role in location-based services. But this result shows low positioning accuracy. So the improve accuracy they used new method to improve indoor positioning which is nearest neighbor (NN) algorithm. Now result show root mean square accuracy improves to 3.3 m to 3.8m. [5] Present to determine user current location or user is currently located at which floor with the help of barometric pressure sensor. In this research paper NAVIO tests with a barometric pressure sensor. The result show that using barometric pressure sensor the building floor at which user is located

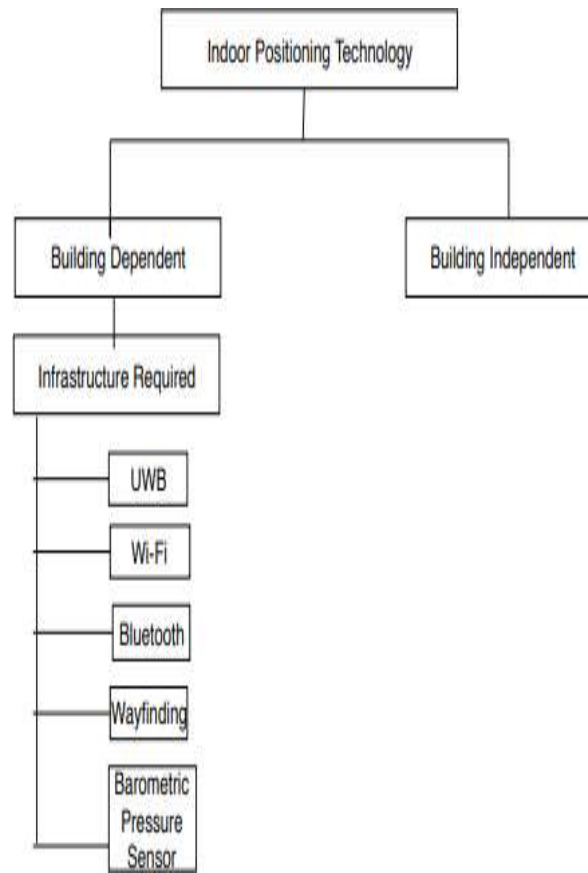


Fig. 1 Different Indoor Positioning Technology

In this diagram there is different indoor positioning technology. Indoor positioning technology is two types mainly building dependent and building independent.

In above literature survey we mention different technology like UWB, Wi-Fi, Bluetooth, Way finding, Barometer Pressure Sensor. In above technology we prefer UWB technology in our project.

### 3. REQUIREMENTS

Following are the requirements that should be met for efficient working of the system:

- The system must be able to perform updates of new software without any manual.
- System should be in updated and latest version so as to be more efficient.
- Development of android mobile application needs a platform which is Android Studio.
- The process of development of application includes designing, coding, connectivity with server of UWB, and lastly the testing.
- The system will fetch the real time data from the server so the updating is needed to get the latest information of the user.
- The language used for coding is java programming language along with XML to design the application.

### 4. PROPOSED METHODOLOGY

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.

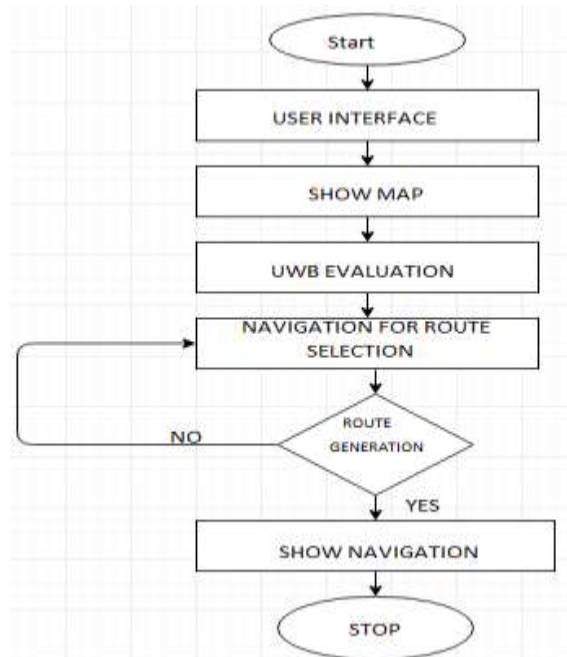


Fig 2. Proposed Methodology Algorithm

## 5. POSITION ALGORITHM

### 5.1 TDOA Algorithm

This 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 arrivals at multiple nodes. The time difference is 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 at least three reference nodes of the curve area. And in 3-D space there are four reference nodes.

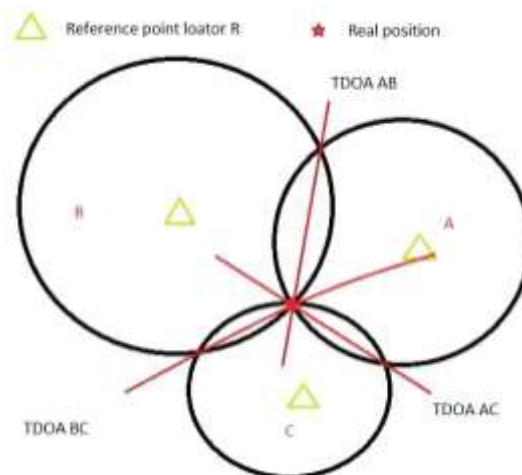


Fig 3. TDOA Algorithm

## 6. MODEL USED

### 6.1 SWOT Analysis

SWOT analysis is a strategic planning technology used to help in planning project through its key attributes strengths, weaknesses, opportunities and threats.

**Strengths:** The main advantage of UWB is that it is license free. It provides high level of multipath resolution and it also has large bandwidth. This system provides high data rate communication. The energy consumed by UWB is low. UWB does not require carrier for transmission.

**Weaknesses:** The disadvantage of UWB system gets affected by potential interference. UWB affects GPS. Short pulses in UWB take long time for synchronization.

**Opportunities:** It these opportunities in following fields:

- Military applications
- Industrial warehouse application
- Shipboard application
- Indoor localization system
- Tracking system
- Robot guidance

**Threats:** UWB system is expensive than other technology discussed in literature survey. Designing and implementation of UWB system is quiet challenging.

## 7. RESULT

In environments where optical sensors are not working or not sufficient, ultra-wideband (UWB) radar is an alternative technology for localization, mapping and object recognition. This paper presents an approach for indoor map building using UWB radar and a simple mobile antenna array with one transmitter and two receivers. It requires no a priori knowledge of the surrounding and no additional infrastructure. A feature based approach with an underlying state space model is used. The data association problem is solved by grouping in the measurement space. Tests with simulated and measured data show that accuracy up to 10cm can be achieved so far

## 8. CONCLUSION

In this paper, we present our study on UWB positioning and how we developed a 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.

## 9. REFERENCE

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