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Implementation of Indoor Wireless Tracking System using Wi-Fi

Payal Tat[1], Manisha Nimbekar[1], Aboli Varpe[1], Sayali Gadade[1], Swati Khodke[2]

Bachelor of Computer Engineering, JSPM's Bhivrabai Sawant Institute of Technology and Research, Pune, India [1]

Professor, Computer, JSPM's Bhivrabai Sawant Institute of Technology and Research, Pune, India[2]

Abstract: We typically use wireless location network for getting direction to a particular area using GPS. We can effectively track and map the location we visit, however GPS cannot be applied in the indoor environment. Hence to save the cost we use RSSI- based trilateral location algorithm. This algorithm is one of the most used algorithms in sensor based network using Wi-Fi. We can calculate the current location of the mobile devices and navigate to a particular destination and use minimum mobile battery. Indoor navigation is one of the newest innovation in the mobile technology and we use extensively.

Keywords: WiFi, Tracking, Indoor, Mapping, blueprint, navigation.

I. INTRODUCTION

Wi-Fi based application typically used Wi-Fi connection to send and receive data ultimately interacting with people on the internet can be done with the help of Wi-Fi. This is the primary usage of Wi-Fi but instead of just sending and receiving data it can be used to effectively map the multiple location in the vicinity in the implementation of Wi-Fi primarily we used network based cables to convert wire connection to unwired connection Wi-Fi is a technology which allows devices such as mobile phones, tablets, etc. to connect to the WLAN networks it mainly uses 2.4GHZ UHFS and 5GHZ SHF radio bands. Typically WLAN is password protected but it may be open which allows any device to access the resources of LAN network. Tracking is used typically to search and find a particular person or object in a scenario. The basic tracking can be done online using multiple third party application we typically map the areas where a person is going and used satellite to give exact location of a particular person or object. Incidentally using of tracking was done as sport where animals where track their movements and then hunted. The alliance defines Wi-Fi as WLAN product based on the 802.11 standard. The creation of Wi-Fi has assured multiple advancement and advantage. Tracking was typically done outdoors that is in the outside world. But there is a need for indoor mapping for the malls and public places. Indoor tracking helps to determine where we are and where we want to go it is a good way to determine the constraints which will be required for a particular shopper in a mall based environment.

II. LITEREATURE REVIEW

A. Crowed sourced map

There are multiple ways to create application where crowd sourcing can be used for mapping a particular area in the city. Using funding to create apps in a quicker manner is easier when funding& help comes from crowd. We have seen multiple applications using crowd sourcing for quicker deployment. These applications are free but come with variety of limitations. The crowd source map may content incomplete or wrong information it will create confusion in minds of the users.

In this paper, we aim at tackling the challenges due to incomplete obstacle information in crowd sourced indoor maps, especially at the initialization stage of crowd sourcing [1].

B. Milli-meter- waves massive arrays

Massive array for environmental mapping is typically used to map a singular environment based on multiple aspects. Using radar based model we can map multiple environments in a concise manner. The millimetre ways are most important to determine a specific environment based spectrum from 30 to 300GHZ. This high frequency band can be used to map the environment and produced high power weaponry. Usage of theses system are typically military and scientific based. There is introduction of the concept of a personal mobile radar operating at millimeter-waves and consisting of massive array for accurate environmental mapping [2].

C. Time delay estimation in wireless networks.

Time delay can be used to effectively create and develop tracking for multilevel application. Time delay can be used infrared the state of network connection between 2 or more host. The delay can be used to measure the network load and also evaluate the available bandwidth. The wireless latency is important to effectively construct a packet based structure. A Wi-Fi based device has a back off period before sending. The duration of this period is a combination of a randomly selected number and the duration of busy periods due to other traffic on the

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network.In indoor wireless localization, navigation and communications, knowledge of the poor plan is valuable side information &provides more reliable performance.[3]

D. Exploration and Observation Planning.

Exploration and observation planning is needed for any indoor based planning. Using robots based cameras we create maps based on the multiple resolution which are seen and encountered by focusing on a view point planning for observing for a set of important regions. Using a robot based system to first explore an environment and make a map then use this map for localizing informative religion and plan for sequence of view point from which all regions can be observed. This paper deals with an observation planning forindoor mapping. We consider the case where it makes a map with different resolutions; it observes informative regions from near positions [4].

III.IMPLEMENTATION

In this section we will give an overview of the implementation to successfully run such an application using our phone localization of wifi is an implementation to give us a wide look about the signal degradation and multi tri-lateration of a computational complexity using received signal strength indicator or RSSI.

In this application we discuss using the RSSI as measuring matrix between multiple locations in a comprehensive platform based implementation. This paper focuses on implementation unilateral variable to give a analysis of the multiple brand based structures as a selection criteria using touch based screen we plot the point on the basis of x and y axis to calculate minimum required strength implementation and to tread of between localization and a comprehensive methodological foot print based system. Leading journal indicate the requirement of multiple quantified analysis which helps to create an system to indicate the real time steps undertaken. Similarly the implementation of this project will contribute to easier finding of places and quicker analysis and tracking of multiple users based. This study was undertaken to understand the usage and importance of indoor map creation. The analysis indicates creating an indoor based application for malls or any entity is important due to the vastness and the length of structure. As an overall result the usage of application will create ease the usage of the user to make his life better. The Wi-Fi based indoor tracking will definitely help the people who are in an unknown environment. The creation of this project will also help aged an old people to navigate and reach the final destination.

A. Framework

Experimental conducted in the paper are carried out at home, as were the layout of the floor is presented in the paper as figure. We limited our work to only one floor as there was a space constraint. We choose home due to unavailability of a blueprint of the college. Incidentally we consider to study points in the home were specific directions let to specific space or house.

B. Experimental test bed

Once a user uploads the floor plan map to the application .The application scales the approximate grid size to localization techniques are performed to quickly do the collaboration. The localization process consist of two phases data collaboration phase where reference data information is required to the data base and the localization phase where application is deployed with the reference information to calculate users relative position to the reference.

1] Data collaboration phase: This phase involves collecting valuable data on the basis of the collaboration done on the step of the user. This collaboration is important to detect the steps of the user and to give a idea about exactly how the user walks

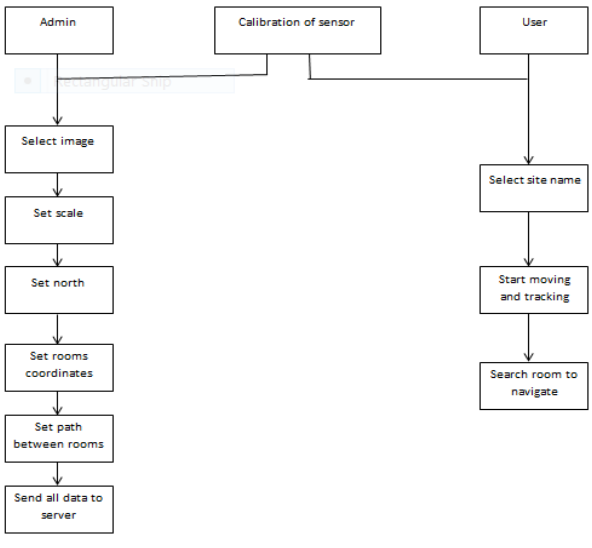
2] Localization phase: During the localization phase the localization application computes the relative position to previously define reference position figure shows the screenshot application. The screenshot demonstrate the results obtained from two localization techniques compare to the exact location the application we developed also provide navigation system they provides details about each area of floor anyhow to get place.

IV. EXPERIMENTATION RESULT AND EVALUATION

Experimentation was performed in comprehensive manner to get real time based position and implement dynamic binding between multiple location or better implementation. The implementation consequently estimate a by linear approach in the systemic version when the signal may create or estimate unstable on or unreal results in localization.

V. SYSTEM ARCHITECTURE

Proposed Architecture Diagram:



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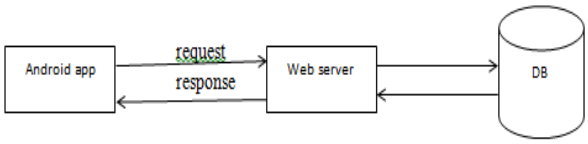

Fig1: System Architecture

Fig1 shows the complete architecture of the system to be used. The architecture consists of sensor based environment mapping for recognition of multiple rooms in an effective manner. The architecture contains the usage of android based application to map and get direction to reach to a particular room.

VI. SCREENSHOTS

FIG 1

FIG 1 indicates a screenshot of the application which gives us ability to create a new project and to upload any blueprints if possible. This screenshot is the home page of application where one can select exiting project or create new project.

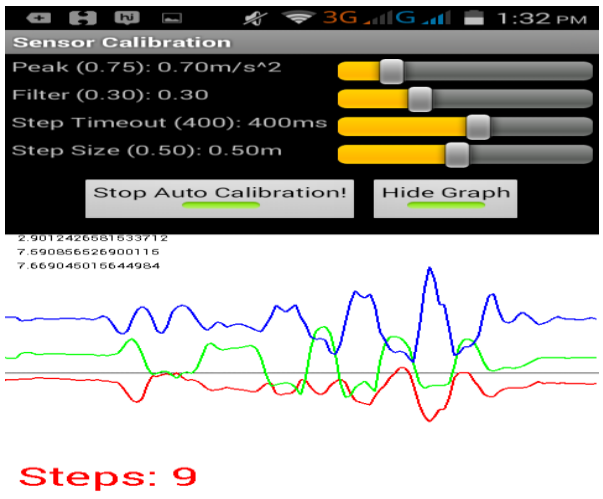

FIG2

Fig2 indicates the setting page of calibration to detect footsteps. In this screenshot we can see sensor calibration at its beginning.

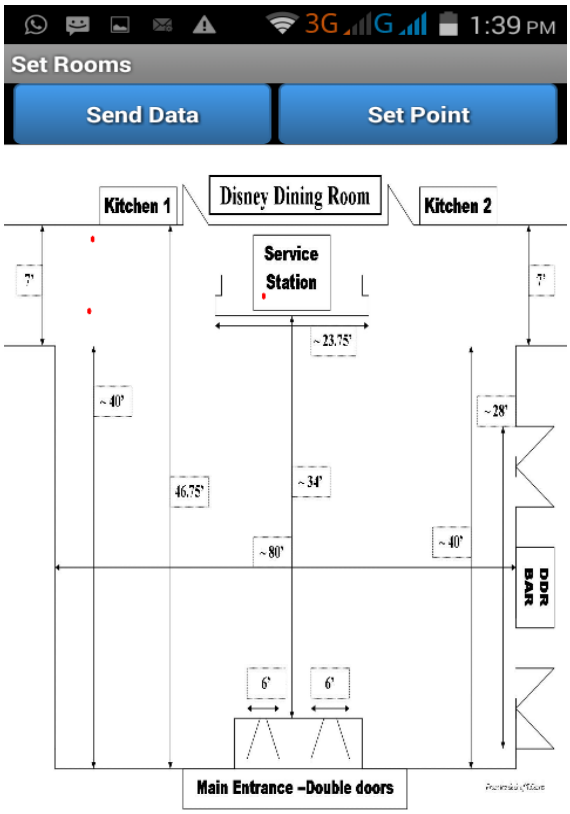

FIG 3

FIG3 indicates the basic blueprint used for effective indication about the floor which includes number of rooms located in blueprint.

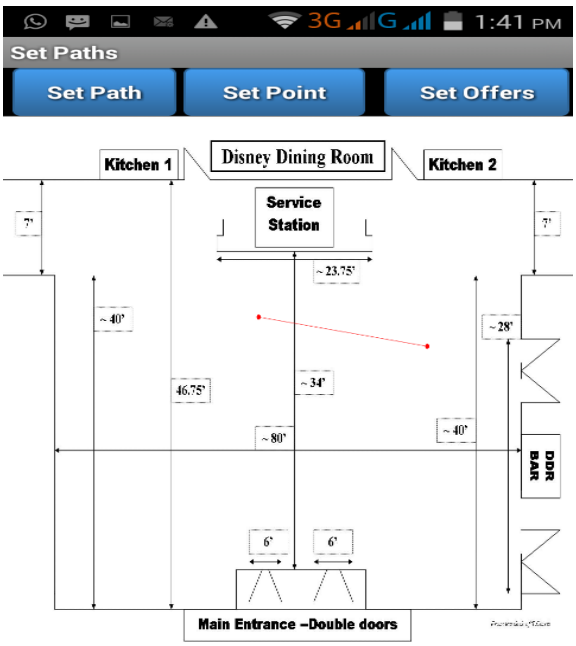

FIG 4

FIG4 indicates the basic blueprint used for effective indication about the floor which includes number of rooms located in blueprint.

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VII. CONCLUSION

This paper describes a mapping system which combines multiple planning based models that are exploration and observation. The system first explores an unknown environment to make a map using blueprint which needs to be acquired. The map is analysis to locate the informative regions where future observations are needed. The blueprint gives basic idea of that particular location and can be used to generate a specific map which can be used for navigation. We also investigate the multiple tradeoffs between the planning cost and the plan quality.
There by in this paper we have created an application indoor in an easy manner and give result on the basis of location we have there by using this application we can quickly integrate the dynamic estimation of the blueprint and the number o footpath that will be created to ensure easy and effective indoor mapping. We see a huge scope in the future which will help even the old people. This application will be a steppingstone to achieve complete mapping of inside of the apartment. We see huge development in such a application and we are sure that this application will be a one of kind.

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