Search Nearby Doctors Using Augmented Reality

Vaibhav Shewale, Pravin Dhumane, Mahesh Gholap
Student
Dhole patil College of engineering wagholi pune 14

_____

Abstract - The aim of this paper is to build an Android Application using Google Maps and Augmented Reality (AR) concept to provide user friendly interface and flexibility to quickly find nearby hospitals, doctors and access information like doctor's address, contact numbers and also can find out nearest medical store at anytime from anywhere. Now a Days user uses their mobile device for many purpose like searching any places or information using GPS and internet, playing games, reminders, social networks, etc. Users in unknown area face difficulties to find nearby doctors or hospitals in emergency cases. AR (Augmented Reality) is innovative technology which provides a real time world environment and let you present an enhanced view of real world [1]. Location tracking or GPS tracking technology could make a big impact on human beings and well being in future. This functionality provides all necessary the information on android device.

Keywords — Android operating system, Augmented Reality, Google maps, GPS, Compass Sensor, JSON
_____

INTRODUCTION

Now days it is necessary to have a proper system which will help user to quickly find nearby hospitals or doctors. This application is based on Android operating system. It helps user to get the hospital's location, doctor's location, contact details and address provided by social organization and the location of medical stores. We are implementing Augmented Reality (AR) concept on android devices [5]. This android application uses GPS of android device to access location and compass sensor to easily map physical objects with camera. Augmented reality (AR) is one type of virtual reality. This technology mainly works with the help of various sensors which are embedded in the mobile device [4]. It can be used on any type of connected devices and screen. AR is used in many applications like medical, manufacturing and repair, engineering design, entertainment, manufacturing, robotics, military training etc. In Our application first user selects the radius, after selecting radius, user will select the category of doctors, process the data, plot the location of selected category, and provide doctor's contact details with the help of Google Services and JSON parsing.

PROPOSED SYSTEM

In this application user can quickly access details of nearest hospitals, doctors and medical stores despite of his/her current location, and it can also locate nearest dentist, orthopedics, and gynecologist. The important feature of this application is augmented reality. Google Map is used to find any particular location or to trace the path between any two locations but it simply deliver the top view of the map so it make complex situation for user between the mobile standard north (that is fixed), and the frequent change in position of the user in real time. AR makes use of various sensors embedded in the android device [4], like Location sensors i.e. GPS, the location sensor find out user's current location and Compass sensors to collaborate physical object with device camera [1].
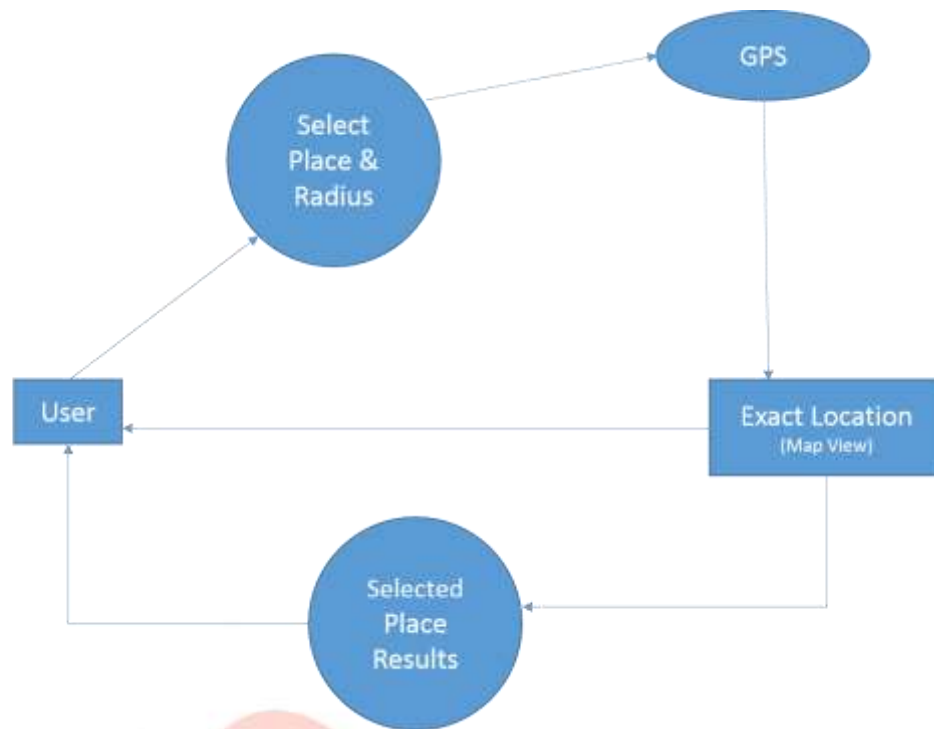
Fig- Data Flow Diagram

To overcome device's direction problem we are developing an android application that allows user to select location and then gives options to select parameters like category of doctors, medical store or hospital (The data flow of proposed system is given in above diagram). If user selects category of doctor then application provides list of doctor's type then user can select the type of doctor from list like Dermatologist, cardiologist, optician, dentist, pediatrician, gynecologist, neurologist, orthopedic, etc. and it automatically identify your current location and plots selected category on a Google map using marker and provide an short description on it about the place. The system supports two navigation modes (Google Map View and AR View) and the user can switch between them by pressing a button on the mobile device. Navigation modes are as follows:

1. Google Map view -

In Google map view, the application is continuously accessing location with high accuracy by comparing between its GPS and signals from the network provider, and using these to determine the user's location. After the device initializes the user's location, it displays user's current location on the map view. After determining the user's desired destination, the system connects to the Google server using the Google Places Application Programming Interface (API) in order to obtain place information. The calculated place information is sent in JSON format (which contains a list of geo-coordinates) and it is drawn on the map. The user is provided an option in the map view to convert to from a street map view to a satellite view.

2. Augmented Reality (AR) view -

In the AR view the place object gets mapped with device camera to obtained satisfied result. In order to visualize the place object correctly on AR view, sine formula is applied from the given place information by the Google map server. In this android application all data is synced with Google server (as we are using JSON parsing). There is no need to manage separate database. The directional object is superimposed on the real world scene that is being displayed on the mobile device's screen, so enhancing the sense of location and place finding.

Sr.No	Model Name	Information
1	UI Model – User Interface of Application	UI Model shows the category section for doctors & distance in meters.
2	Map Model – Google Map View	Shows the current location of user on Google Map
3	Doctor Search Model – Find Doctor Near Your Location	Find doctors using Google Map
4	Augmented Reality - AR View (Collaborate camera with Compass Sensor)	Show Augmented Reality View

Table-Models

The location need to be real time because all users have access to the map, they need to know where exact location is. There are two types of location coordinate to find exact location of user.

1. Network Location Provider.
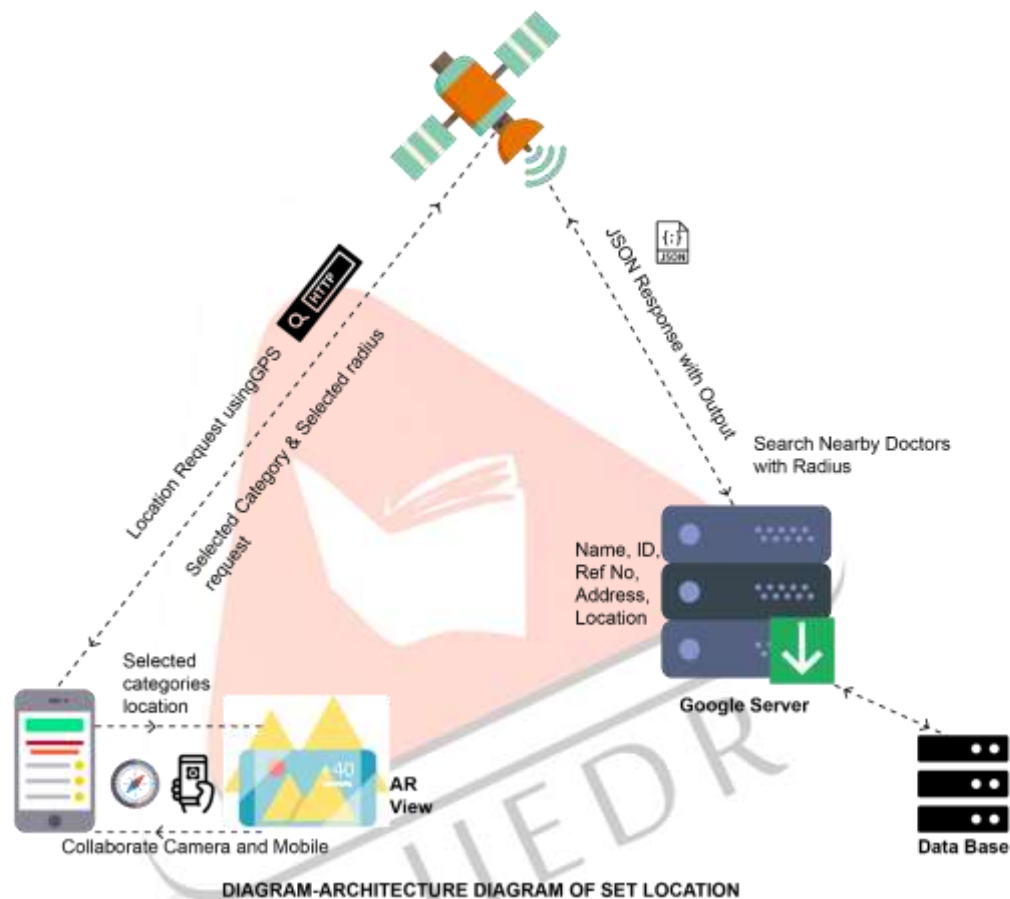2. GPS Location Provider.

Network and GPS Location Provider are two different ways to get Android device location (Latitude and Longitude). Both have got their own advantages .for example ,In in-door situation GPS may not provide location quickly and Network Location Provider

is quick. Network Location Provider uses our mobile connectivity provider and gives nearest tower location where GPS give exact location where user is stand.

GPS Location Provider
GPS is a technology which determining a location using signals from a network of satellites. This satellite transmits data continuously. The signal contains data that a receiver uses to compute the locations and make other adjustments which are needed for accurate positioning. All that's needed is a GPS receiver and a clear view of the sky to receive signals from at least three or four GPS satellites. The basic GPS service provides users with approximately 7.8 meter accuracy, 95% of the time, anywhere on or near the surface of the earth. Common uses of GPS include vehicle navigation, tracking the location of business assets, mapping for outdoor recreation.

SYSTEM ARCHITECTURE

DIAGRAM-ARCHITECTURE DIAGRAM OF SET LOCATION

Working of system
- Retrieving GPS data and sending an automatically-generated message:

    System receives GPS signals from satellites and stores it in user's vicinity, and then GPS unit calculates data which include three-dimensional velocity, position and time information.

- Processing of GPS data and storing of GPS data into database

    GSM terminals are used at both ends. GSM terminal at sender's side process the location information acquired from the GPS unit and sending it to web server via Short Message Service and the other GSM terminal at the server side is responsible for transferring the data to the local device. GPRS communication Network is involved to act as an intermediary that connects the both ends the user and the server. Finally, the program embedded in the device will plot users' position onto Google Maps. Propose system allow user to use Augmented Reality View. So a user can create query by scanning the nearby place with a camera in real space and searches accessible content along the place using information space. Then, system plots the results on both sides of the street so it solves the issue of Overlapping.

LBS (Location Base Sensor)

LBS is use to track user location and also provides traffic information, it also provide security for device. Location-based services use geo-data of mobile device to provide information. It is refer as set of applications that accomplish the knowledge of the geographical location of a mobile device in order to provide services based on that information [2].

TECHNOLOGY AND CONCEPT

Augmented Reality:
Aim of AR is to combine virtual and real scene together to achieve that virtual ones are belong to the real world. Technologies are developing continuously that changes the nature of work and human lifestyle. In this world numbers of mobile devices are using augmented Reality [1]. Being characteristic of integration of virtual and real scene, many applications of Augmented Reality are emerging, such as in field of education, medical treatment and entertainment [7].
Types of Augmented Reality:
- Location based AR
- Projection AR
- Recognition AR
- Outline AR

We are using Location based AR. It consists of Marker (Object) based and Marker Less AR. Marker based AR uses camera while Marker less AR uses GPS and Digital compass sensor.

CONCLUSION

In this paper we have presented an android based application to quickly search nearest doctor, hospital or medical store with Google maps and augmented reality. Augmented reality view simplifies direction/navigation problem of Google map. So in case of emergency conditions or at unknown place our android application will provide facility to find hospital location, doctor's address and contact details.

REFERENCE

[1] Global Illumination for Augmented Reality on Mobile Phones: Yong Beom Lee§ Samsung Advanced Institute of Technology Samsung
[2] Amit Kushwaha, Vineet Kushwaha _Location Based Services using Android Mobile Operating System International Journal of Advances in Engineering & Technology, © IJAET ISSN: 2231-1963.
 [3] M. Alcaniz, D. C. Perez- Lopez, and M. Ortega, ―Design and Validation of an Augmented Book for Spatial Abilities Development in Engineering Students‖, Computers & Graphics, 2010, 34(1), pp. 77-91.
[4] J. Joachim, R. Newcombe, and A. Davison. Real-time surface lightfield capture for augmentation of planar specula surfaces. In Proceedings of the 2012 IEEE International Symposium on Mixed and Augmented Reality (ISMAR), pages 91–97, Atlanda, USA,Oct. 2012.
[5] Francois Andry, Lin Wan and Daren Nicholson, ―A Mobile Application Accessing Patient's Healthcare Records through a Rest API, ‖IEEE 2012.
 [6] Onlive. Onlive Last accessed: 28 March 2013. http://www.onlive.com/.
[7] Hand-held Mobile Augmented Reality for Collaborative Problem Solving: A Case Study with Sorting: 2014 47th Hawaii