

Implementation Paper on Navigation App

Neha Vanjani Darshika Bafna Nikhil Kewalramani
 Computer Science Engineering
 Jhulelal Institute of Technology
 Nagpur, India

Abstract- Navigation is an important functionality these days. This paper aims at shedding some light on small scale navigation systems implemented on IOS platform. For this paper we will consider intra - college navigation system and construct a custom navigation scheme and technology for this purpose. This application is an IOS navigation application, in which it will help people to get directions from any place to JIT College. It will guide every individual to reach various classrooms, labs, and administrative departments etc. which are located inside the college. The application will also provide shortest route from any source to destination inside the college. This application will showcase a polyline interface from any source provided by the user to destination outside as well as inside the college.

Basically, our application will help any new individual to find JIT College not just during online exams but also during the participation of Shikar that is the national event of JIT College.

Keywords- Mobile Application; scale navigation, intra – college navigation, Mobile Application; New People in city; Navigation; Directions; iOS; phone; Pipe lines; GPS; JIT.

I. INTRODUCTION

Navigation on IOS platform was initially based on Google Maps. Later in 2013 Apple.Inc launched its own map service called Apple Maps. Our paper aims at shedding some light on small scale navigation systems implemented on IOS platform. It is created for the betterment and ease for any user which help any new individual to find JIT College that is not just during online exams but also during the participation of Shikar that is the national event of the college.

These services use graph theory and shortest path algorithm to find shortest path from starting point to destination. All IOS applications now use Apple Maps API and can be customized to meet specialized needs. For example – We have fix destination in application as JIT. So user can find directions from any stating point to JIT. Later the application enters intra – college navigation mode.

The main purpose of this application is to guide people to reach JIT College which belong from various places.

As these people are new in the city and they don't know any road and landmarks so with the help of this navigation they can navigate themselves from their current destination to JIT College. With the help of the application not only they will be guided outside the college but also, inside the college as it is intra college navigation. Once they have reached JIT then the user's can also make use of the feature i.e. intra college. It will help the user at any point for example- if the user has reached the college gate from there

if he wants to any specific classroom then he will be guided till it application involves tools such as Code , Cocoa framework.

The tools that helped us to create the app

A) Xcode-Xcode 6 introduces a new way to design and build software. It's easy to create a brand new application with the help of xcode c

B) Cocoa framework-Cocoa is Apple's native object-oriented application programming interface for operating system. It consists of the Foundation Kit, Application Kit, and Core Data frameworks.

C) *Map View Controller* – The main component of the application is the mapview controller since it is in charge to control, at any time, the position of the user and the direction

Towards which the phone device is pointing, to generate the proper indication in each situation: “go straight”, “turn right”, and turn left "and" turn around. Our controller also checks the position where we are, in order to adapt the view of the map to the characteristics of each function, showing only the position of the destination where we want to go, or all the other buildings around us.

The arrangement of the application is as follows:
 It has two sections –

First – It tell how user will be navigated from current location to hardcoded destination

Second – It provides intra college navigation by giving image which contains a map which shows source to destination & also textual message if image is not understood by user properly.

II. TECHNICAL SPECIFICATIONS AND DETAILS

Application is based on IOS platform. It has two stage navigation systems. First stage uses Apple Maps API customized to fix destination as JIT. This is inter - college stage, which directs user from any destination to college. It also uses GPS for increasing accuracy.

Stage 2 consists of intra – college navigation. But GPS has error of 8 meters on an average. So if small scale systems are to be implemented, GPS is not a solution. For this we make our own indigenous constructs.

A) Get Me- It will allow users to get their location, when they open the application, it will open the maps in UI view controller via MK map kit and redirect location using polyline overlay from source to destination .In simple words the Get me function will provide user its current location so that it can establish the shortest path to the destination i.e. JIT. In the figure below shows the get me function.



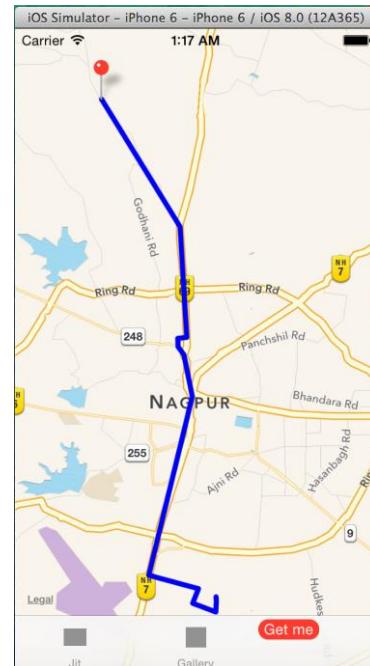
B) Polyline –The concept of polyline is defined as a continuous line composed of one or more line segments. A polyline is created by specifying the endpoints of each segment. Apple is supplying this information to help you plan for the adoption of the technologies and programming interfaces.

The MKPolylineView class provides the visual representation for an MKPolyline elucidation object. MKPolylineView strokes the path represented by the annotation. The area enclosed by the path cannot be filled by this class. The color and other drawing attributes of the path can be changed by modifying the properties inherited from the MKOverlayPathView class. This class is typically used as class and cannot be sub classed.

In our application, a polyline concept is used as enrouteing the route from any source to JIT College and it will also help user to find within the college. The polyline is also used in Intra College maps provided to enroute to any labs, classrooms, administration office etc to the user. In other applications, an arrow is provided to show the route to user. But for the users, it is confusing at times as sometimes it provides a longer route which is not convenient for the user and time consuming too.

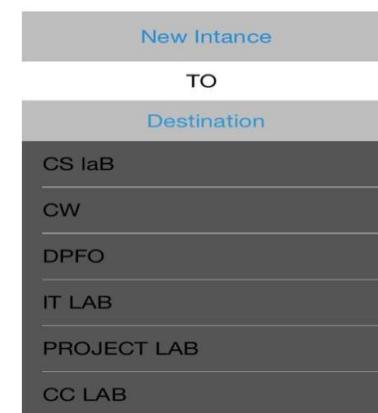
In our application, a polyline is used which will help user to take the correct path to JIT college. Due to polyline concept, the user will not get confused at any point

of time in or out of the JIT College. As there are no confusing arrow is used in the application.



C) Intra College- It will show user the map of Intra College, that is, the exact location of various labs, classrooms, etc. Below the map, there will also be text notation. In case the user is new to college for any purpose like exams, seminars, etc. It facilitates the user to enter its current location i.e. source and the destination (seminar hall, labs, examination hall, classrooms and washrooms). Upon receiving the input the app displays a polyline and same text which directs the user to intended destination.

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The below figure illustrates the intra college functionality of the app.

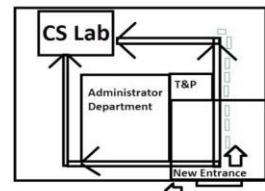
Here the user gives the input as,

Source = Main entrance

Destination = CS Lab

Upon this input, the app constructs the shortest path to reach from main entrance to the CS lab. It provides the user with the text explanation of the path to avoid any misleading.

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III. CONCLUSION

Hence we conclude that such intra – college application will be highly useful and can be tweaked to transform into a whole new other system as well. Also it should be noted that there are innumerable inter-college navigation applications but intra – college one will be first of its kind (officially no record exists of any such existing application).

IV. FUTURE SCOPE

Suppose we have to set up navigation system in JIT we would install signal emitters at fixed locations customized to send signal of its location. We can fix emitters at all corners and important locations. A predefined referenced map is already programmed into the application which acts as basis for all intra – college navigation. The IOS based device fixes the user's current location by identifying signal strengths from various emitters and then user selects its destination. Each emitter is a vertex of graph and then shortest path algorithm gives the least long path available from user's current location to its selected destination. This system has accuracy much better than GPS at this scale.

We can bolster this application by introducing turn by turn navigation and voice guidance by making involved Graphs more sophisticated, emitter strength calculation more precise and emitters more sensitive. Voice guidance is a simple matter of introducing TTS (Text to Speech) Engine into the application. This makes this application accessible to blind people. This idea is now used in every navigation system.

A small enhancement can be to include recent updates that are happening in JIT.

Also this system can be upgraded to take attendance as each user will sign in on their devices and send signal to a

receiver (let's call it ATTENDER). It will receive those request signals and mark attendance of each student. For security purposes with each attendance request signal, MAC address of each device will be sent so as not to have multiple sign-INS from same device with different accounts.

Also further enhancements are possible if required.

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