

ANDROID APPLICATION USING GPS NAVIGATION

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Abstract — Being in the era of Generation IV systems and technology is growing and changing at almost every nanosecond. Smart Phone's and Palmtops are also no exception for the same. Everywhere we keep on listening the word Android & Maps which is at its pick of success amongst youngistan. Due to rapid growth and huge changes in Android, we decided why not to design an application which can user prone as per their need. So, we designed a set of multiple applications like Place Marking, Shortest Path Strategy & Weather Predictions for Next 4 days. These applications work with co-ordination with Google Maps in live environment to keep track of the Places and points of interest as per user for future use. Also these applications find the shortest path and weather prediction for next four days in degree centigrade as well as Fahrenheit

I. INTRODUCTION

In recent years the mobile has become the valuable part of the human beings. It is necessary for human begins to have a powerful device which will provide all the facilities other than basic facility available in mobile phones. Android provide such functionality which enables the developers to design such applications which will make a simple mobile to smart one. "Android is built on the open Linux Kernel. Furthermore, it utilizes a custom virtual machine that has been designed to optimize memory and hardware resources in a mobile environment. Android is open source it can be liberally extended to incorporate new cutting edge technologies as they emerge. The platform will continue to evolve as the developer community works together to build innovative mobile applications." [8] [9]

The proposed system is going to provide the facilities to the users when user is newer to any place through the application named places directory. Another application of proposed system is shortest path is going to provide the service to user by mining the shortest distance between source and destination. The last application named GPS Alarm of proposed system will provide the notification to the user of arrival of its specified destination while travelling in the form of alarm.

II. MATHEMATICAL MODEL

System S=Android Application

System S={S', I, δ , O}

S' = {GPS, Google Earth}

I = {PD, SD, WF}

δ = Function

O = Output

I 1 = PD → Places Directory

I 2 = SD → Smart distance

I 3 = WF → Weather Forecast

[1] **I 1** = { 'Hotel', 'Hospital', 'Bank', 'café Area', 'ATM',.....,n }

δ 1 = I 1 → O 1

O 1 = {Phone no. , Address, Map, Distance, Reviews and Ratings }

[2] **I 2** = {Source, Destination}

δ 2 → Cal

$$\text{Let, } F(M) = \sum_{i=1}^n \text{Cal}_i$$

Cal = {R, Dist}

[R = Routes, Dist = Distance]

R = {R₁, R₂, R₃, ,R_n}

R1 = {Source, C₁, C₂, C₃,.....,C_n}

[C = City]

Dist = {D₁, D₂, D₃,.....,D_n}

[D = Distance/Route]

$$\text{Source} = \text{Distance [Source]} + \sum_{i=1}^n \text{Distance-}$$

Between [Source, C_i]

$$\sum_{i=1}^n C_i = \text{Source}$$

If R= Null

$$\sum_{i=1}^n D_i = \text{Source}$$

$$\text{Min-Distance} = \min (D_i, D_{i+1})$$

$$O_2 = \{\text{Min-Distance}\}$$

$$[3] \quad I_3 = \{\text{City, Country}\}$$

Let, F= Fahrenheit //temporary variables

C=Celsius

$\delta 3 \rightarrow F, C$

If checkbox is clicked

$$C = (F-32) * 5/9$$

Else

$$F = C * 9/5 + 32$$

$$O_3 = \{\text{weather for current and next four days.}\}$$

III. RELATED WORK

As mentioned in the previous chapter, application development for Android mobile phones is not uncommon, For example, Voice search, map ruler2 for android, Accident Alarm system.

A. Tianhe Zhang proposed voice search application

It includes a technique for improving the performance of automated voice search services intended for mobile users accessing these services over a range of portable devices [4]. Voice search is implemented as a two stage search procedure where string candidates generated by automatic speech recognition (ASR) system are re-scored in order to identify the best matching entry from a potentially very large application specific database.

Limitations

- 1) Language pronunciation Barrier
- 2) It is not helpful for dumb people

B. Hart proposed A*algorithm

It is based on a greedy best-first search algorithm. A*algorithm uses a heuristic function to evaluate from starting location to destination location. The heuristic function is divided into two functions: the path-cost function and the heuristic estimate function [5]. The path-cost function is the cost from starting location to the current location and the heuristic estimate function is the estimation cost from current location to destination location.

Limitation

- 1) Time consuming.

C. Halvey proposed the average time segmentation method

It uses the average values increase and decrease a user-specified range as the time segmenting positions. However, the user-specified range is still a difficult definition value [6].

Limitation

- 2) Less accurate.

D. Gonzalez proposed method to calculate shortest path

It considers some environmental factors that may reflect the influence of the velocity of vehicle, and then these factors are used to build the decision tree. The velocity of vehicle is evaluated by the current environmental situations [7].

Limitation

- 1) Not accurate because of environmental factor.

E. Wang Wei proposed an alarm notification for traffic accidents

It can automatically detect a traffic accident, search for the spot and then send the basic information to first aid center within two seconds covering geographical coordinates, the time and circumstances in which a traffic accident takes place [3].

IV. PROPOSED SOLUTION

A. Algorithm For Places Directory

```

Display the list of applications
if (apps == PD) // PD = Places Directory
{
    Display the list favorites.
    Select one of the places.
    Display all the sub places come under
    Selected place.
    Display information of selected place.
}
    
```

B. Algorithm for shortest path

```

if (apps == SP) // SP = Shortest Path
{
    Take Input from user // (source, destination)
    Cal (source, destination)
    {
        Source = Distance [Source]+  $\sum_{i=1}^n$ 
        Distance-Between [Source, Ci]

         $\sum_{i=1}^n$  Ci = Source // Ci = No. of Cities
    }
}
    
```

C. Algorithm for Weather forecast

```

else
{
    // apps = Weather Forecast
    Take input from user. // i.e. city and country
    If checkbox is clicked // F, C= temporary
    variable
        C= (F-32)*5/9
    Else
        F= C*9/5+32
    Display weather information to user.
}
    
```

The challenge addressed by mobile was the ability to get exact location from the specified favorites, finding the shortest path with faster speed and notifying the user about the specified destination while travelling.

Pointed out from the research that many applications has been developed, but some of them

dependent on automatic speech recognition, time segmentation, while those applications do not provide exact information about place which user required and exact shortest path in terms of distance.

After studying many researches papers and also addressed many problems but the one's mentioned above are the major issue so the proposed system will try to solve many problems related with speech recognition, time segmentation.

In order to help the user who is newer to the city, at travelling time and to get the common shortcuts, Places Directory, Smart distance and weather forecast are one of the best options.

V. EXPERIMENTAL WORK

1. Places Directory

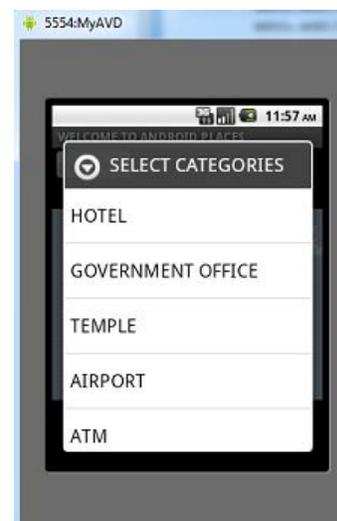


Figure 1 Places Directory Input

This form will provide list of favorites to the user. According to user input place it will switch to next form in which user will get the pin point location of that particular location on the map.

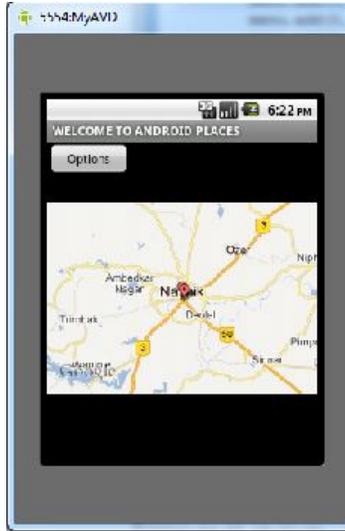


Figure 2 Places Directory Output1

This form will give the pin point of the user's favorite place and after clicking on the pin point user will switch to the next form.



Figure 3 Places Directory Output2

This is the output form of the places directory application in this form the user will get the detailed information about his / her selected place.



Figure 4 Places Directory Tagging feature

This form will take the input from the user for the one of the new feature of the places directory that is tagging. In this user will tag his /her favorite place. And after filling it the user will switch to next form in which he will get information related to his tagged place.

2. Smart Distance



Figure 5 Smart Distance input form

This form will take the input from the user in the form of source and destination. And after clicking on the find tab the user will switch to the next form.



Figure 6 Smart Distance output form

This the outputs form of the smart distance application. The user will get the shortest path in the form of map view on his screen

3. Weather forecast

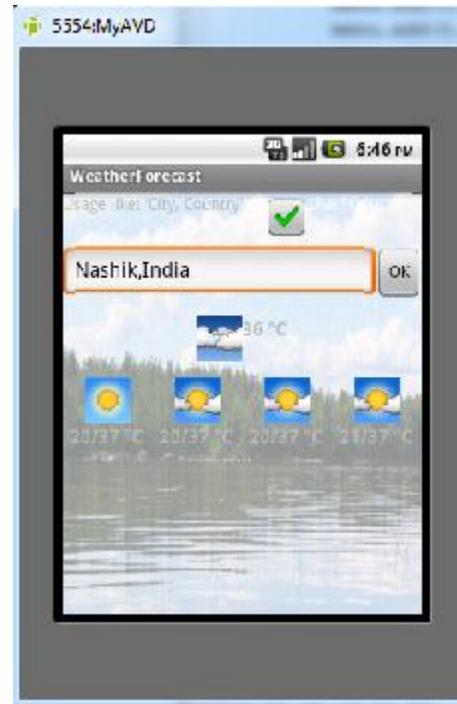


Figure 7 Weather forecast output form

This is the output form of the weather forecast showing the result of the given city in pictorial form. With the additional forecasts of the upcoming four days.

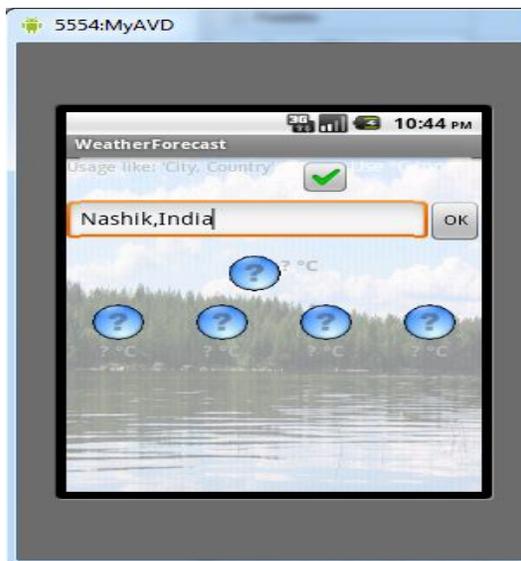


Figure 7 Weather forecast input form

This form will take the input from the user in the form city and the country. And after clicking on the ok tab the user will switch to the next form.

CONCLUSION

The main objective of Android applications using GPS navigation is to provide guidelines to the person who is newer in the city and while travelling. As proposed system includes application Smart distance that provides the shortest way to reach the destination so that valuable time of person gets saved. Another application named Places Directory provides the facility to find out various places nearby to the person that peoples usually need to visit daily. Again another application named Weather Forecasting provides service in terms of weather information of specified place with pictorial info.

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