# Virtual Guide for Tourist

**Aniket P. Chaudhari[1], Akshay S. Bhargude[1], Ameya J. Joshi[1], Tushar D. Anekar[1], Mrs. S. A. Chiwhane[2]**

Student, Dept of Computer Engineering, NBN Sinhgad School of Engineering, Pune, India[1]

Asst. Prof. Dept of Computer Engineering, NBN Sinhgad School of Engineering, Pune, India[2]

**Abstract:** In tourism it recommended that user should get relevant and accurate information about the tourist places and the locations. About each place, abundant information is available, hence first priority is to filter out appropriate information and give it to the user. This paper describes and depicts the development of an application for allsmart phones, which user can use at the time of travelling. In this paper, we are discussing implementation of a tourist application which will provide appropriate recommendations about places to the user at the time of tour planning. Suggestions of places will be base probabilistic matching of parameters age, hobbies, and the tour type. A complete system will be implemented in giving precise information to the users, in a language which is universally accepted. The main focus will be on giving recommendations to the user based on tourist's user profile consisting age, hobbies, tour type. Also information about tourist places will be available in audio format. Also, user will be provided with the option of downloading of tour plan if it goes out of range of internet connectivity.

**Keywords:** User profiling, Bayesian Decision Making, Probabilistic matching methodology.

## I. INTRODUCTION

One of the world's major source of income can be categorised as tourism. Tourism generates revenue to the country as well as provides employment for many of the population of the world. Previously old tourism information systems which relied on PC and other terminal equipment, can only satisfy the random inquiry of tourism attraction, such as the introduction and tours, instead providing real-time weather information etc.However, increasingly improvements are being made to existing technologies. There are many systems which can provide geographical data but primarily GIS (Geographic Information Systems) is one of the best. Mobile tour guide systems have been improved due to GIS. The increase in the millions of smart phones will enabled sensors to capture user's information. Availability of precise information about the place and the location must be considered as key factor to make tourist's trip satisfactory.

Tourism is an industry which is present with abundant amount of data therefore there is heavy dose of data on tourists which can sometimes result in information overload. A major problem caused as a result of this is that both of these categories (relevant information and irrelevant information) of tourists are almost certainly not getting an experience to match their particular interests. Many a times a huge group of people are guided by a single guide who also narrates irrelevant information to the tourists. Now a day in the field of context-aware mobile applications a user can query what attractions are 'nearby' using the phone's current location [2]. However, outcomes of this query are returned with ascending order of distance. Either little or no processing takes place to personalize the results to the user's choices. Tourists are of different backgrounds and varied age differences, motivation, level of affluence and activities. The virtual guide deals with the development of a flexible system for use in museums, forts, monuments and hill stations. The typical virtual guide user will help him to access data appropriate to the tourist's places. The idea of context has a vital role in virtual guide. This paper discusses to provide appropriate facilities to the user for tourism. The provision of context aware services is based on visitor location awareness which results into provision of context aware services. Based on this knowledge, the system will be able to adjust the context content and services (location-based services). Particularly, based on the user profile, the content is adjusted. Bayesian network will help in such processes. Based on trained Bayesian network, the application will then return points of significant interest to the tourist based on their current personalization settings.

## II. LITERATURE SURVEY

### A. User Profiling

The recommendations given by context-aware mobile applications are better and appropriate once an application has been used for some time; it is very much possible to absolutely learn the user's behaviour. Bayesian techniques help in learning user's behaviour. Nevertheless, the initial loading of an application shows that there will be no usage history to decide the context of the user [1]. In such case, initial assumptions are made. This process is known as user profiling. User profiling can be achieved using social media. Social media helps in deciding user's 'Family Cycle'. An efficient method of determining the user's 'Family Cycle' stage is using social network information to make an informed decision [5], as shown in Table 1.

| Family Cycle Status | Measurement |
|---|---|
| Married no children | Age <55, married and no children |
| Full nest I | Age <40, married and children present |
| Full nest II | Age >40, married and children present |
| Empty nest | Age >55, married and no children |
| Single parents | All ages, unmarried and children present |
| Single | Age <55, unmarried and no children |
| Solitary | Age >55, unmarried and children absent |
| Others | All others |

Table 1: Family Life Cycle Stages & Measurement

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**B. Bayesian Decision Making**

A Bayesian network is a probabilistic acyclic graphical model. It depicts a set of random variables and their conditional dependencies using directed acyclic graph. The Bayesian network consists of 'Nodes' which constitute probability variables. 'Directed Arcs' are used to represent influence between each linked nodes. Bayesian networks have widely been used in language processing, intelligent system. Bayesian networks are used to use evidence node in predicting whether the possiblevalues of associated nodes are larger than a predetermined threshold [2]. For recommender system which accepts user context and pattern history into account, conditional probabilities must be updated dynamically. A Gradient approach can help in Bayesian networks for such updating operation.

Bayesian network decides probability of visiting of user to each type of destination. At start, there will not be any pattern history. The purpose of using a Bayesian network is to find out how likely it is that the user will visit each type of tourist attraction [2]. At this time, Bayesian network will use 'group probability' to give the recommendations. However, with the use of application through time Bayesian network will be created for an individual and this will be used for giving recommendations. Recently visited and the level of interest assume will be parameters based on which on which recommendations will be given.

## III. IMPLEMENTATION

Proposed system architecture will consist of user, wamp server for storing, fetching of data. User will communicate through wireless connectivity. Traditional tour recommender systems are based on common methodology of matching user likings to place features. But in this paper we tried to club some novel techniques of data mining, probabilistic matching and reinforced learning to improve traditional tourist recommender systems. Parameters like user's age, likings, hobbies, feedback, ratings etc. are considered for recommendation. All the tourist's preferences are considered to obtain more user centric recommendation system. The system takes customization from user and this customization is used as basis to obtain suggestions. User's preferences, tour history of similar age group are combined also provide an API to access the Google maps. So with thehelp of the Google maps and the location APIs, the application can show required placesto theuser on the map, also with the help of probabilistic matching recommendation system is defined. Reinforced learning is applied with the help of previous reviews and feedback.

A. Probabilistic matching methodology:-

1) User customization is taken as input.
2) The database is queried to select matching results for user customization
3) The results are filtered from redundancies by keeping top match as highest priority
4) Tour history of similar age group is used to filter out the results obtained from above group.

5) Finally, to build user interest previous ratings provided by user is considered as an effective method of reinforcement of results. The weighted sum of above explained steps can be finally considered as major ordering factors.

## IV. EXPERIMENTS AND RESULTS

The above explained methodology can be explained with the following example. User customization (Age 21, Hobbies: Trekking and Painting, Place: Pune) is taken as input sample for recommender system. Once the input sequence is consumed the following important query set executed as recommender method.

SELECT SUM (VISITED PLACES = 'Value' AND AGE = 'Value') FROM TABLE_NAME
SELECT SUM (PLACES) FROM TABLE_NAME WHERE HOBBIES = "Value Set"

Then the results from query set are filtered out to obtain unique values which are ordered by Ratings to obtain Reinforced knowledge.Finally, the likeliness of particular place to user's preferences can be obtained with expression:

$$\$arg[\$cv]=\$arg[\$cv]/pow(\$category\_count,\$exp-1);$$

Experimental result on Input set (Age 21, Hobbies: trekking, painting, Place: Pune) is shown in below diagram.



Fig 1: Selection of tour          Fig 2: Tour Planning

**B. Downloading:-**

It is possible that when user is on tour, it loses internet connectivity or data pack gets expired. Hence, this application provides an easy way to download the tour plan entirely, so that user can refer information of places from downloaded file. Also, there is provision audio information of places suggested in tour.
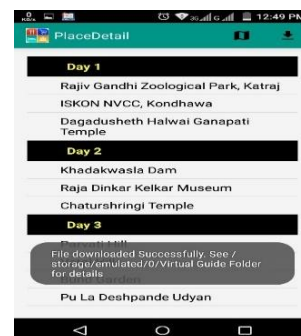


Fig 3: Downloading of Tour Plan

## V. CONCLUSION

We have mainly focused our discussions on providing the contextualized information to the tourists. It will help us in providing accurate information to the user. In particular, virtual guide can provide users place suggestions according to their hobbies and age parameters. When the user moves out of the current location or goes out of range of internet connectivity, the app will download tour plan. Also information will be provided in audio format to user. In future, different data mining techniques such as Apriori Algorithm can be applied to give more precise information to the user. This in a way will change the approach of tackling the problem.

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