SJIF Impact Factor: 6.260| ISI I.F.Value:1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 5 | Issue: 4 | April 2020 - Peer Reviewed Journal

SMART TRAVEL PLAN GENERATION SYSTEM USING IMAGE CLASSIFICATION APPROACH

[1]Kavya V
[1]Student, Final Year CSE, Saveetha Engineering College, India

[2] Hariharan Shanmugasundaram
[2]Professor, Department of CSE, Saveetha Engineering College, India

ABSTRACT

Travelling involves exploring new and previously unseen places. Each person's interest varies from the others' interests. The current travel plan generators make users to manually select places that they want to visit, thus making them require knowledge about the place. The model proposed in this paper, classifies images using an image classification algorithm, uploaded by the user and identifies the users interest by finding the type of place that is most visited. The users' interest calculated by the classification algorithm is termed as the personal interest score. The model then calculates a route that covers places of types that the user prefers and is closest to the destination given by the user.

KEYWORDS: *Travel plan, tourism, image classification, personal interest.*

1. INTRODUCTION

Travelling is a practice followed by all, around the world. The tourism board makes billions of dollars as revenue each year[1]. However, the experience and satisfaction of travellers do not usually align with the high profits of the industry. Travellers are required to have a huge budget and a good knowledge about the places that they want to visit. Spending a lot of money only to visit a place that they did not like very much is a total waste. For people who would like to travel, there are two options available currently. One, approaching a travel agency and choosing a tour package from the ones available. Here, there is no option for the travellers to customize the plan based on their interests. To solve the problem of customization, online travel plan makers are available where it lets the travellers to choose the places which they want to visit. After selection it lists the activities that they can do in that city.

The drawback here is while it is a good solution to local travels, for longer distances, the travellers are required to know about the places themselves before they make the plan. There is no option to guide them through based on their preferences. These online plan makers often lead to experiences which aren't satisfied due to lack of tour guidance. The paper is organized in the following way. Section 2 explains the proposed model followed by the architecture, results in subsequent sections. We have also presented the sample dataset and the next section provides the sample output.

The current travel plan generators are based on recommender systems that suggest travel plans based on the ratings and responses given by other users to the plan [3]. Some of the models only consider generating an optimal path to reach places faster as a suggested travel plan to the users [2]. The existing models also provide best routes based on factors such as hotels, transport facilities, overall experience of other travellers to select a particular route as the best route [4]. Studies have shown that using classification techniques preference of users can be identified and can be used to benefit the user in generating a personalized result [5].

2. PROPOSED MODEL

This paper proposes a model for a smart travel plan generator that would give importance to the personal preferences of users over other factors. Data representing the preferences and personal

SJIF Impact Factor: 6.260| ISI I.F.Value:1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 5 | Issue: 4 | April 2020 - Peer Reviewed Journal

interest of users depending on type of place. Using Image Classification algorithm, a personal interest score is calculated for each user to identify their interests. Based on this score places would be suggested when a travel plan is generated. A start and end location as input from the user will generate a travel plan that covers places that align with the users' interest by calculating a route that covers all places closer to the destination and with better ratings. Provisions to provide manual ratings about previously visited places is also accepted as input as they provide vital data about the user's personal interest. These ratings provided by the user will be added to their personal interest score based on the type of the place.

3. PROPOSED ARCHITECTURE

The proposed architecture is presented in Figure 1. In the model, set of images with no limit for the maximum number of images that can be uploaded, is stored in the image folder upon successful uploading from the user side. The images are sent as input dataset to the image classifier neural network which calculates a personal interest score (PIS percent) that would remain a key factor in determining the kind of places that the model would suggest to the user.

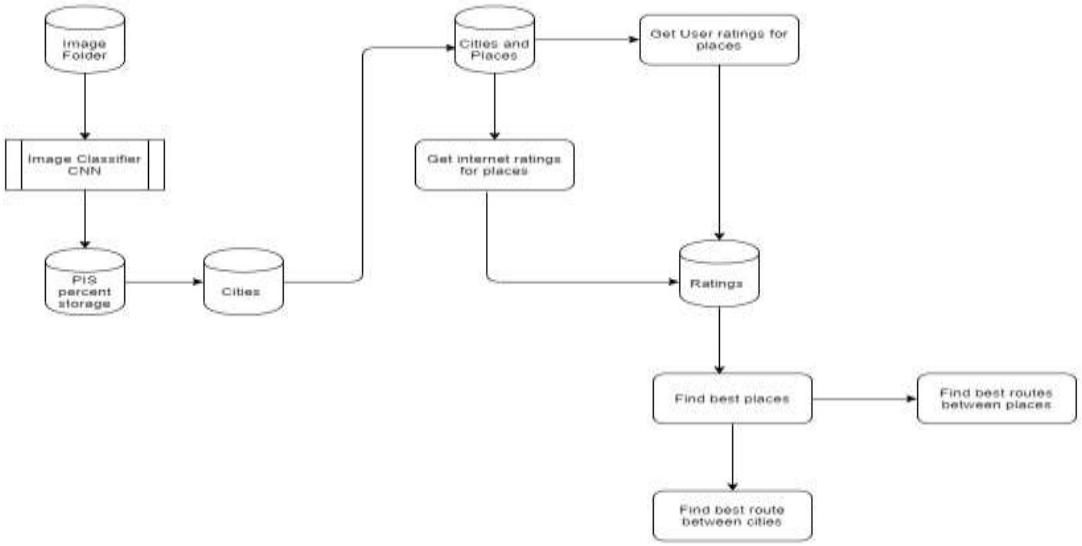

Figure 1. Proposed architecture

Individual databases are maintained for storing important data that are essential for calculating other factors such as, names of cities, places that can be visited and the ratings for each place that would help in generating a suitable plan for the user. Users can also contribute to the dataset by providing ratings for places that they have visited. These values are of prime importance while finding places that align with the user's interest. The best routes between the cities and between places to visit in a city are calculated by using the shortest path algorithm. The best route that is suggested to the user is the one that requires the least distance to be covered during the journey.

Finally, the generated travel plan is displayed to the user. By clicking on the city name, places that can be visited in that city can also be viewed. The cities and the places in each city are all aligned with the user's interest which can be verified with the PIS score calculated using the classification algorithm. Given below is the algorithm (figure 2) that shows the operational flow of the model after the calculation of the personal interest score for the user. It explains the use of various databases and the criteria which must be fulfilled to be selected as the best city to visit according to the user's interest.

SJIF Impact Factor: 6.260| ISI I.F.Value:1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 5 | Issue: 4 | April 2020 - Peer Reviewed Journal

```
Input: Image folder, start location st_loc and end location end_loc
Output: Travel Plan tp containing places and routes
Begin
Feed the images from image folder to train the CNN and calculate personal interest score.
for ctg in places_categories
dict d[ctg] = pis rate on 10
load the dictionary data into the PIS table.
sort cities in city_table by distance from st_loc.
for city in sorted(cities)
   if city.type_of_place != ctg[max(pis)] in PIS table
cities.pop(cities.index(city))
ratings = avg(ratings_table.user_rtn, ratings_table.internet_rtn)
for city in cities
   places = city and places table.places
   sort places by ratings
opt_places[city] = [places[-3:]]
for city in cities and places in opt_places
   find best route using Google map services and display the best routes
end
```

Figure 2. Algorithm of proposed model

5. EXAMPLE DATASET

A travel plan between two sample places was generated as a sample to demonstrate the working of the model and the calculation of the Personal Interest Score (PIS). A collection of images covering three types of scenery images such as Hills, Beaches, and Entertainment places such as circuses, theme parks were uploaded to provide data about the user. The personal interest scores of the user for each type of place is calculated by the algorithm and is stored in the PIS table. The ratings are stored in the ratings table and the cities and their places are stored in their respective tables. Table 1 shows the PIS table values for the sample data. Table 2 shows the ratings that are provided for the various places.

Type of place	PIS percent
Hills	7.8
Beaches	7.7
Entertainment	4.5

Table 1. Personal Interest Score table

Place ID	Avg. internet rating on 5	User rating on 5
501	4.5	5
502	3.3	3
503	3.7	5
504	3.3	4
505	3.6	5
506	4.2	5
507	3.6	5
508	3.6	5
509	3.5	5
510	4.3	4

SJIF Impact Factor: 6.260| ISI I.F.Value:1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 5 | Issue: 4 | April 2020 - Peer Reviewed Journal

511	4.2	4
512	3.5	5
513	4.2	5
514	4	5
515	3.5	4.5
516	4.2	5
517	3.4	5
518	3.4	5
519	3.1	3
520	3.5	3
521	4.5	5
522	3.4	5
523	4.4	5
524	4.4	5
525	4.4	5
526	4.4	5
527	3.8	4
528	4	4
529	3	5
530	3	4

Table 2. Ratings table

Figure 3 shows the page where users can upload their gallery images to provide data to the model. These are given as input to the algorithm which then calculates the PIS percentage. Figure 4 shows the page where, the two mandatory inputs are given: the start and the end city name. The travel plan is generated as shown in the figure 5. On clicking on any city name, the places to visit in that city is shown as in figures 6 and 7.

SJIF Impact Factor: 6.260| ISI I.F.Value:1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 5 | Issue: 4 | April 2020 - Peer Reviewed Journal

6. SAMPLE OUTPUT:

Figure 3. Users upload images as input to the algorithm

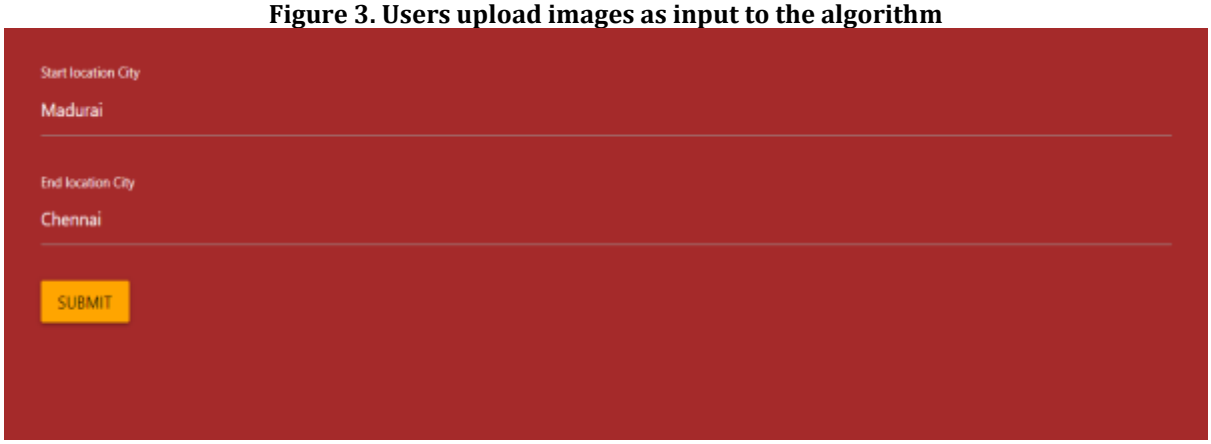

Figure 4. Users provide start and end cities for their travel plan

Figure 5. Generated travel plan

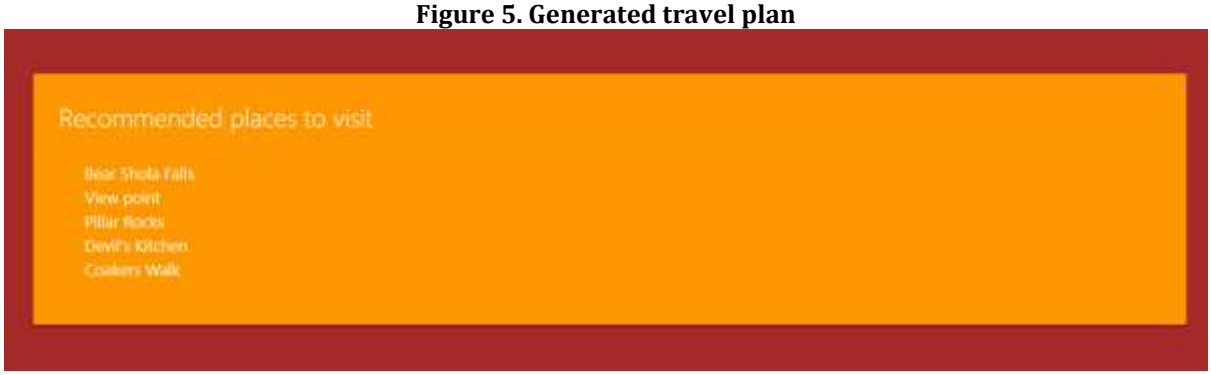

Figure 6. Detailed plan for the individual city1

SJIF Impact Factor: 6.260| ISI I.F.Value:1.241| Journal DOI: 10.36713/epra2016 ISSN: 2455-7838(Online)
EPRA International Journal of Research and Development (IJRD)
Volume: 5 | Issue: 4 | April 2020 - Peer Reviewed Journal

Figure 7 Detailed plan for the individual city2

7. CONCLUSION AND FUTURE ENHANCEMENT

The model proposed in this paper suggests a smart travel plan generator that generates a personalized plan for the users based on their travel preferences and interests that is calculated by classifying images uploaded by the user. Future enhancements for the model can include adding a recommender system to the model that compares the various plans generated for each user of similar interest types and recommending a plan that the user would prefer the most.

REFERENCES

1. *Wikipedia contributors. (2020, March 21). Tourism in India. In Wikipedia, The Free Encyclopedia. Retrieved 07:51, March 28, 2020.*
2. *Batz G.V., Geisberger R., Luxen D., Sanders P., Zubkov R. (2012) Efficient Route Compression for Hybrid Route Planning. In: Even G., Rawitz D. (eds) Design and Analysis of Algorithms. MedAlg 2012. Lecture Notes in Computer Science, vol 7659. Springer, Berlin, Heidelberg.*
3. *heng, B., Su, H., Zheng, K. et al. Landmark-Based Route Recommendation with Crowd Intelligence. Data Sci. Eng. 1, 86–100 (2016).*
4. *A. Taneja, P. Gupta, A. Garg, A. Bansal, K. P. Grewal and A. Arora, "Social graph based location recommendation using users' behavior: By locating the best route and dining in best restaurant," 2016 Fourth International Conference on Parallel, Distributed and Grid Computing (PDGC), Waknaghat, 2016, pp. 488-494.*
5. *L. M. Wang, M. Qi and C. E. Lin, "User Preference Awareness in City Traveler Helper System Based on Naïve Bayes Classification," 2008 ISECS International Colloquium on Computing, Communication, Control, and Management, Guangzhou, 2008, pp. 618-621.*