

TripEneer: User-Based Travel Plan Recommendation Application

Surender Reddy Yerva, Flavia Grosan, Alexandru Tandrau and Karl Aberer

Distributed Information Systems Lab
 Swiss Federal Institute of Technology (EPFL)
 Lausanne, Switzerland

{surenderreddy.yerva,flavia.grosan,alexandru.tandrau,karl.aberer}@epfl.ch

Abstract

Current travel recommendation systems are helpful in addressing a traveler's information needs to certain extent, however, most of them fail to factor in the user in their recommendations. TripEneer proposes travel recommendations to a traveler by keeping the user preferences and constraints as first class citizens. We present an intuitive UI for helping users plan their travel trips quickly and easily. In the current demo we present various global and user-specific ranking models used for recommending travel destinations. Our preliminary evaluation showed that the users found the personalized recommendations, based on the user model, most useful.

Introduction

Nowadays, spontaneous trips in popular European cities are made easy by the plethora of cheap means of transportation, visa relaxation policies and overall globalization. Because reaching the destination is quite easy, planning the activities there should be equally easy, but current online solutions do not cover this search space too well.

On the one hand, travelers can find generic landmarks by checking Wikipedia, Lonely Planet or via Google. These generic landmarks do not include any user preference and do not allow easy discovery of new landmarks. As it is common in power law distributions, where rich get even richer, most popular landmarks at a travel destination are promoted more often by these online systems, thus depriving the user of potential interesting landmarks that tend to occur in the long tail of power law distribution.

On the other hand with the advent of Web 2.0, it has become easier for a user to express himself on various social networking websites. It is possible to model the user and infer his preferences by taking his online activities into account. The recommendation systems, that consider the user online activities, can provide far more useful recommendations adapted to the user personality.

Additionally, once the user made up his mind about the activities to pursue, it is very difficult to obtain a map with the optimal route to visit the wanted locations. TripEneer is a prototype trying to solve these problems: *easily choosing the landmarks*, and *planning the trip path*. Focused on

London, Rome, Boston and other popular cities, TripEneer gathered the landmarks available from Lonely Planet¹ and FourSquare² with their respective rankings. TripEneer proposes five ways of ranking these landmarks. Lonely Planet provided ranks are modeled using a power law distribution and a weighted average is computed with the rating provided from Foursquare. Another ranking is based on Foursquare signals: the sum of check-ins, tips and number of active users. In addition to these collaborative approaches, we rank landmarks by their proximity to locations visited by a user's Facebook friends. The Facebook profile information is used to compute a similarity value with each landmark and propose a fourth ranking solution. The last hybrid approach combines all the above using a user-specific weighted average mechanism.

Shi et al. use location data from user-uploaded photos and a collaborative filtering paradigm to recommend items favored by other users (Y. Shi and Larson 2011). We adapted this approach in presenting a ranked list based on what a user's Facebook friends visited, but the current work distinguishes itself by exploring other sources of location data and by recommending landmarks based on individual user profile instead of crowd-sourcing. Frankenplace (Adams and McKenzie 2012) is an application for similarity-based place search that allows users to interactively find new places starting from features extracted from the travel blogs of existing places. On the contrary TripEneer proposes landmarks based on the user model.

In this demonstration we allow the user to interact with our TripEneer application, and we show and discuss our different ranking models, and allow the user to start planning his trips. We deployed our system here³ and the users can start to interact with the system.

TripEneer Framework

Landmarks and Users are the main entities in our TripEneer framework. We use various data sources to richly model these two entities. Rich features of the Landmark entity are extracted from the data provided by Lonely Planet, FourSquare, Wiki-Travel and TravelBlog. The fea-

¹<http://www.lonelyplanet.com>

²<https://www.foursquare.com>

³<http://www.tripeneer.com>

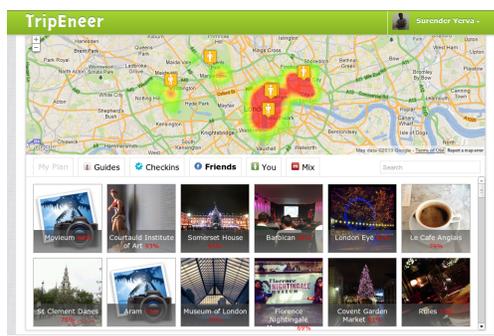


Figure 1: TripEneer Application: The various tabs showing different rankings. The heat-maps showing the popularity of various landmarks.

tures include description, popularity, geo-location coordinates, events and images of the landmark. A User model, similar to the entity model (Yerva, Miklos, and Aberer 2012), is developed from the features extracted from the user's Facebook, Flickr and Personal Blog profiles.

TripEneer proposes five different ranking models, based on the landmark and user features, for addressing the various users requirements.

Guides Ranking: Provides ranking based on the popularity of a landmark statistics accumulated by travel guides and by crowd-sourcing websites. The guide rank was modeled as a Zipf function. This value was averaged with the normalized crowd-sourcing rank.

Check-ins Ranking: Considers the normalized number of signals on Foursquare. These features indicate the activity around a landmark.

Friends-based Ranking: Ranking based on proximity to locations visited by a user's Facebook friends. The heat-map view provides a social context to the landmarks.

User-based Ranking: The user preference is modeled through Facebook profile information such as: pages liked by the user, about-me description and his posts. The landmarks are ranked using the distance-similarity function between the user model and the landmarks description.

Hybrid Ranking: The above four ranker values are averaged to obtain a combination of landmarks from all sections. The users can customize the weights for each score. In the future work, we plan to infer these values based on the users activity.

We have crawled many popular locations for the TripEneer application. It contains 10 locations and on average 370 landmarks per destination. The framework is developed on many scalable components and can be easily extended to many more destinations with little effort. In our preliminary evaluation we observed that personalized landmark recommendations were most useful to the user. The heat-maps corresponding to the landmarks visited by a user friends were informative and useful to the user.



Figure 2: TripEneer Application: The map showing the landmarks visited by users friends. The heat-map view provides a social context to the landmarks.

Workflow: The user logs in to TripEneer application using his Facebook credentials. TripEneer creates a user model based on the information extracted from the users Facebook profile. Next when the user chooses a travel destination from the Dashboard (for example: *London*), the application provides landmark recommendations under different rankings tab. The user chooses different landmarks by exploring the different ranking tabs. The *MyPlan*-tab shows the set of landmarks chosen by the user. The map view provides a simple tour proposed by the framework.

Conclusion

In this paper we presented TripEneer, a personalized tour planning application. When a user is planning to visit a certain tourist location, the TripEneer application helps recommending the landmarks specific to his user profile, along with the general recommendations from Lonely Planet, Wiki Travel, etc. Users can view the landmarks both in the classical travel guide way, or can discover new places which match their preference. The users of the system liked the personalized rankings provided by the system. The friends-based ranking helped the users to readily identify which of their friends have visited these landmarks and can be contacted for further information.

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