

# Venue Recommender for Events based on User Preferences

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**Abstract**-Venue recommendation for hosting popular Meet up events is a perfect example of a recommendation problem where multiple entities interact and influence each other. In this paper, we present a deep learning based venue recommendation system deep venue which provides context driven venue recommendations for the Meet up event-hosts to host their events. While recommending suitable events and groups to Meet up users, we have taken into account the users preference of visiting venues extensively, Motivated by these endeavors, in this paper, we propose a venue recommendation methodology for Meet up hosts to organize popular events. The Recommended venue should be suitable for all the members in a group.

**Keywords**-Deep Learning, Venue Recommender, Collaborative Filtering, Group Recommendation.

## 1. INTRODUCTION

There is a tremendous growth of internet and its related services each year. A huge amount of data is generated by the users of internet (social networks, e-commerce applications etc.). This data when analysed and studied properly can provide huge benefits to the users as well as the systems that provide services to these users .One such system is the recommendation system which is an integral part of almost all the applications we use today such as Amazon, Facebook, Twitter etc. Recommendation system which are used to recommend venues are known as Venue Recommendation System. Different approaches such as deep learning, neural networks can be used for this system. One important challenge in these systems is the large amount of data that is generated. Moreover data sparsity is another problem. All these setbacks should be considered and overcome in these systems. It also involves multiple entities such as venues, events, groups and individual user. We propose a content and collaborative filtering based approach. Collaborative filtering takes into account the similarities among user, venue, event. Content based filtering is used to overcome the data sparsity problem. Recommendation of venues can be of two types: single user, group. For a single user, the recommendation is based on their interests which is collected from the user. For group recommendation the venue recommended is based on the location of all the users i.e locations closer to all the users are displayed from which the user selects the best one.

## 2. LITERATURE SURVEY

### 2.1. Event Based Social Networks

Newly emerged event-based online social services, such as Meetup and Plancast, have experienced increased popularity rapid growth. From these services, we observed a new type of social network {event-based social network (EBSN)}. An EBSN does not only contain online social interactions as in other conventional online social networks, but also includes valuable online social interactions captured in online activities.

### 2.2 Recommendation based on Content

Recommender systems have the effect of guiding users in a personalized way to interesting objects in a large space of possible options. Content-based recommendation systems try to recommend items similar to those a given user has liked in the past. Indeed, the basic process performed by a content-based recommender consists in matching up the attributes of a user profile in which preferences and interests are stored, with the attributes of a content object (item), in order to provide the user with new interesting items.

### 2.3 Combining Heterogenous Social and Geographical Information for Event Recommendation

With the rapid growth of event-based social networks (EBSNs) like Meetup, the demand for event recommendation becomes increasingly urgent. In EBSNs, event recommendation plays a central role in recommending the most relevant events to users who are likely to participate in. Different from traditional recommendation problems, event recommendation encounters three new types of information, i.e., heterogenous online+offline social relationships, geographical features of events and implicit rating data from users. Yet combining the three types of data for offline event recommendation has not been considered.

### 2.4 Context-Aware Event Recommendation

The Web has grown into one of the most important channels communicate social events nowadays. However, the sheer volume of events available in event-based social networks (EBSNs) often undermines the users' ability to choose the events that matches their interests. Recommender systems appear as a natural solution for this problem, but different from classic recommendation scenarios (e.g. movies, books), the

event recommendation problem is intrinsically cold-start. Indeed, events published in EBSNs are typically short-lived and, by definition, are always in the future, having little or no trace of historical attendance. To overcome this limitation, we propose to exploit several contextual signals available from EBSNs.

### 2.5 Deep learning driven venue recommendation

Deep learning based venue recommendation system DeepVenue which provides context driven venue recommendations for the Meetup event-hosts to host their events. The crux of the proposed model relies on the notion of similarity between multiple Meetup entities such as events, venues, groups etc. We develop deep learning techniques to compute a compact descriptor for each entity, such that two entities (say, venues) can be compared numerically. Notably, to mitigate the scarcity of venue related information in Meetup, we leverage on the cross domain knowledge transfer from popular LBSN service Yelp to extract rich venue related content. For hosting an event, the proposed DeepVenue model computes a success score for each candidate venue and ranks those venues according to the scores and finally recommend the top k venues.

## 3. PROPOSED SYSTEM

Our proposed system focuses on recommending venue for a group of users or single user. In this system users can add their past and future events successfully hosted in their venue and also the users who attended the events can also add the event details. By doing this we can avoid data scarcity. While searching for a venue based on event the end user has to select type of recommendation i.e. whether it is a single or a group recommendation.

For single user recommendation, the user can select their preference which maybe the events the user wishes to attend. Based on the preference various events in the nearby venue will be recommended to the user.

In group recommendation end user can select list of people going to participate in an event, location of all the selected members will be collected and center point of location gathered calculated and based on user preference venue will be recommended. User can select the venue and send place details to the group along with the route map for the location .It will be displayed for all the users in the group.

The various modules in our system are user authentication, group creation, adding events and viewing nearby events, single user recommendation, group recommendation.

### 3.1 USER AUTHENTICATION

User has an initial level Registration Process. The users provide their own personal information for this process i.e. the user id and password are collected and stored along with the mail id. The server in turn stores the information in its database. The user can also create a group of members. They can add people from their contact list and invite them to attend the events. The events can be anything such as a birthday party, blood camp etc. After successful registration the user can login using their own details.

### 3.2 ADD EVENTS AND VIEW NEARBY EVENTS

Proprietor can add the events hosted in their venues. The venue and the type of event is also submitted by the proprietor. The location of the venue is also stored in database. The guests who attended the event can add the event in database. User hosting events in their house can also select and add event details in the system. Users can see the list of events hosted within 2km radius from their location. They can also search for the other events they might be interested in. For more convenience 2km distanced venues are shown automatically to the users.

### 3.3 SINGLE USER RECOMMENDATION

User can select their preference on which type of place they wish to attend an event. All the nearby events which suits the user preference will be displayed in Google map. User can select and view the location and event hosted in that venue based on the user preference. Collaborative filtering is used to recommend venues to the user based on the user's interest and the past history of events attended.

Initially the user logs in. If the user provides a correct set of credentials the user is taken to their profile. After which the user gives his preference. It can be the type of events they would like to attend, the venues they like. After that the user can give an event as input. The system takes the input and recommends a suitable venue to the user. Also the system notifies about the events that are happening around the user within a 2km radius.

### 3.4 GROUP RECOMMENDATION

In group recommendation end user can select list of people going to participate in an event. Location of all the selected members will be collected and center point of location is calculated. Now the particular location is displayed to the user. User can select the venue and send place details to the group member's .The route map for the location will be displayed for all the users. Initially the user logs in and creates a group of members they need to invite. Then they determine the type of event. The system gets the location of all the users. A center point of all the locations is determined. The venues in

that area is suggested to the user. The user select the venue and updates it in the group.

#### 4. SYSTEM ARCHITECTURE

The working of the system is represented in the above system architecture. The user performs an initial level registration process by providing details like name, email, password, mobile number. The details are stored in a database. The user may add events to the system which includes details like nature of the event, host name, duration of the event, description, fees(if needed).Users can also form a group when they are about to attend similar type of events. Each group is identified by a unique number. Each user enters his/her own preference. They can be either the location in which an event occurs or the type of event they want to attend. Along with the user the preference of the each user as well as that of the group is stored. Whenever a user logs in he/she is authenticated. After that based there are two possibilities. They are:

- i. Single user
- ii. Group of users

**Single User Recommendation:** Collaborative filtering is used to find those events that might match the interest of the user. Users can select their preference on which type of place they wish to attend an event. All the nearby events which suits the user preference will be displayed in Google map to the user. User can select and view the location and event hosted in that venue based on the user preference the venues are recommended

**Group Recommendation:**

In group recommendation end user can select list of people going to participate in an event, location of all the selected members will be collected. Then the center point of all the locations in which the event might be feasible is selected. Finally, the venue is selected by the user. Then, the location is sent to all the users in a google map.

#### 5. CONCLUSION

The major contribution of this system is to propose a model which takes user preferences as well as their current locations to recommend venues for the events or the events that they might be interested in. An event can be completed successfully in the particular venue if

- i. Similar events occurred in the venue in recent times.
- ii. The venue is similar to those venues where similar types of events that have occurred.

In this model we make use of collaborative filtering which takes into account the interest of user based on his past history of events. We also use content based

filtering where we collect datasets of the venues which are suitable for hosting the event but they are not popularised yet. This type of event recommendations uses the algorithm-Content based filtering. Where as collaborative filtering is based on user preferences and likeliness. Further, this system can be extended to recommend movies and used in many other areas which includes multiple factors similar to our system(here factors are venue, event, user, group).i.e it can be used in a multiple entity recommendation problem. For recommending venues we can also consider multiple factors other than location such as hobby, professional details in order to make recommendations more precise.

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