

CS 6220 Project Proposal

Team 6

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1. Motivation and Objectives

Whether traveling or visiting relatives and friends, whenever you go to a new place, enjoying local specialties and participating in a variety of activities will be one of the most important things. Sometimes when you are confident, based on other people's online recommendations, to find a good hotel, restaurant, or event to enjoy the holiday, you find that these recommended restaurants are not in line with your taste. If you don't eat well, the fun of playing is reduced by 50%. That's why we propose this new project: Suggest Me.

Suggest Me will recommend restaurants and events that users may be interested in, which is based on the current user's profile and the historical data of the user (such as his favorite type, price, and service quality of the restaurants), then suggest the user about "your favorite".

Suggest Me will also obtain the user's location to search for popular restaurants and activities around and suggest the user with "Local Special".

2. Related Work

Many applications have been developed to recommend restaurants. For example, many travelers use Yelp, which allows people to evaluate and recommend restaurants, to find restaurants with high ratings and positive comments. However, ratings and comments on Yelp are from strangers who may have different preferences for food from the application user. Another example, Foursquare, which is more related to our project, can provide personalized recommendations based on the tastes of the user and the tastes of people the user followed. However, no application has combined the tastes of users and the preference of people in the same location to recommend restaurants for users.

Previous studies have proposed many location-based personalized recommendation systems [2, 3]. For example, H Wang et al. proposed a recommendation algorithm based on previous user behavior, location, social relationships and the similarity between users [4]. A. Gupta et al. proposed a system using location and users' information from foursquare to recommend restaurants [5]. In our project, we will resort to these studies as references to facilitate our application development.

3. Proposed work

In this project, we will implement a website on which users can get recommendations for the restaurants. Our website includes two parts: one is “your favorite”, which is related to what the user likes, and another part is “Local Special”, which shows the most popular restaurants and activities near the user by using user’s location information. These recommendations are generated based on the Yelp’s databases in the backend.

For each user, we need to calculate his score of each location and then select the top N results as our recommendations. Scores will be calculated based on three factors. Firstly, we use users’ historical data and calculate the similarity between the new place he hasn’t visited before and the old place he has already visited. A higher similarity means a higher score. Next, we will make decisions based on the features in the user's query. For example, if the user wants to find a Chinese restaurant, we will search locations which have the Chinese and Restaurant label. The score of each place is also related to some other features like its reviews and distance from this user. Last, we will calculate the score according to the user’s friends’ or similar users’ historical data. According to research, a user’s preference has some correlation with her/his friends’[6]. So we can make recommendations according to those friends’ data or those users that have a similar pattern to this one. As for the algorithm, we use vector space similarity and Pearson's correlation coefficient to calculate the similarity[7]. We use the KNN algorithm to optimize the recommendation model. And we use matrix factorization for further learning.

4. Plan of action

In this project, we will mine Yelp's data to predict users' preferences and provide suggestions for any user based on his preference and location.

Tool we will use include: Yelp API, Python, PsyPi, D3.js, CSS, ng-map to show Google Map, Kapsarc to store Yelp's Dataset.

Schedule	Target
Sept 21- - Sept 27	Brainstorm, project topic , Implement Project Proposal.
Sept 28- - Oct 5	Project demo meeting. Design the Suggest

	me system, draw with workflow diagram.
Oct 6 - Oct 12	Get familiar with Yelp API, try to retrieve data. Start with frontend and backend implementation.
Oct 12 - Nov 2	Continue working on the system's implementation, keep testing and debugging. Optimize project design based on current situation.
Nov 3 - Nov 16	Recheck and optimize the deficiencies of the system
Nov 17 - Nov 23	Prepare for workshop presentation
Nov 23 - Nov 30	Prepare Demo and presentation

5. Evaluation and Testing Method

The testing can be done by a method called Leave-p-out Cross-Validation. We will cut the original datasets into a testing set of p observations, and use the remaining observations as the training sets. Repeatedly do this process for all different ways to cut. Based on the results, we can assess the fit using the mean squared error(MSE) and error rate.

6. Bibliography

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