

# Eat-Out Recommendation System

Raj Ingle<sup>1</sup>, Manglik Joshi<sup>2</sup>, Rohan Patel<sup>3</sup>, Govind Wakure<sup>4</sup>

<sup>1,2,3</sup>Student, Department of Information Technology, Rajiv Gandhi Institute of Technology, Mumbai, India

<sup>4</sup>Assistant Professor, Dept. of Information Technology, Rajiv Gandhi Institute of Technology, Mumbai, India

**Abstract:** Eat-outs & Dining is one area where there is a massive chance to suggest eating choices to users based on their preferences additionally as historical information. The aim is excellent supply of such information with not solely eating house reviews, but also user-level information on their preferred eat-outs. This report describes the work to be told to predict whether or not a given user visiting an eating house can like it or not. I explore the employment of various machine learning techniques and additionally engineer options that perform well on this classification.

**Keywords:** Websites, javascript and analysis.

## 1. Introduction

Local business review websites such as Yelp and Zomato are a very popular destination for a large number of people for deciding on their eat-outs. Being able to suggest native businesses to users may be a practicality that will be a really valuable addition to those sites practicality. In this paper I aim to make a model that recommends eat-outs to users. The approach using which we are going model this is often by predicting whether or not a user will have a positive or a negative review for the business. We will limit to eat-outs phase inside the business class as recommendation may be a superb slot in that system. One way this model might be utilized in apply is by having associate automatic 'Recommend: Yes/No' message once a user visits a eat-out's profile page. The approach is to be ready to predict yes/no for any given eating place and user. In this work, we are going to primarily explore the subsequent directions:

- Optimization algorithms to predict the specified label
- Develop options that will facilitate improve the accuracy of this model.

There are systems that exist these days that suggest user eat-outs, however none of them model the matter during this thanks to predict a yes/no given a user and a eating place. To my data, this is often the primary answer that tries to suggest a Yes/No given a user and an area business. One assumption we tend to build during this work is that the reviews knowledge isn't biased by the label i.e. the majority of users are uniformly writing reviews for eat-outs they visit, and not as a result of their smart or unhealthy expertise.

## 2. Problem statement

An Eat-out recommender system typically won't have sufficient historical information to build profiles for individuals. Having limited or no information about the user translates to a user cold start recommendation. Cold-start problem, is a situation in which the system needs to recommend a product to a new user that has no past information or a new item with very few or no ratings at all. The only valuable source available with Eat-out Recommender System is the user's reviews which can be used to characterize the group of context. Mining the reviews and iterating the information using both Collaborative iterating and sentiment/opinion analysis helps to solve the cold start problem.

To solve this issue the following contributions are made in this project like: 1. Project combines Collaborative Filtering with Sentiment Analysis to overcome cold start user problem, while ensuring high accuracy. 2. Context like eat-out type, user's location and user's preference are included as additional information for personalized recommendation. 3. Several experiments are conducted on datasets and the result shows that proposed hybrid framework is competitive against classical approaches. So in order to categorize these comments or to predict the best outcome among the posted comments recommendation is needed. Recommender System is an e-client tool that considers an individual's opinion to identify their content more appropriately and selectively. This system has been applied to various domains, but in the field of research area, service based recommendation system plays a major role.

## 3. Proposed system

The proposed system consists of three components. The first one is web scraper whose purpose is to scrap user's reviews from web sites and other social networks. The second component is arranged for analyzing user reviews and specifying positive and negative sentiments from collected review data set. The last one is a collaborative filter that provides recommendations. This paper focus on a study involving the second part which is the sentiment analyzer for reviews see figure below.

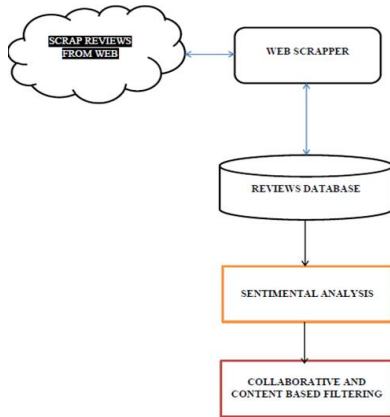


Fig. 1. Overview of the system

The sentiment analysis part system begins by scraping reviews from the net and preprocesses the reviews information set for sentiment analysis operation. The preprocessing method aims to refine the reviews text from components that decrease the potency of machine learning for sentiment analysis operation like stop words and finding the stems (root) of words in every review text and saving the result refined text in corpus list, preprocessing algorithm below illustrate this procedure:

**Algorithm 1: reviews preprocessing algorithm**

Input: n reviews dataset

Output: Corpus of n normalized reviews

$l=0$ ;  $n$ =number of reviews in dataset;

1. While ( $i < n$ ) do
2. input review (i)
3. keep English characters [A-Z,a-z] in review(i)
4. convert review(i) to lower case
5. for all words in review(i) do :
  - Stem (word) in review (i)
  - Remove stop word in review (i)
6. add review to list corpus[ ]
7.  $i=i+1$
8. end

Fig. 2. Reviews preprocessing algorithm

The resulted corpus of reviews is ready for next step which is building the bag of words, dividing the dataset of a bag of words into a training set, and testing set. After that naïve bayes system or any other machine learning model would undergo training to predict and differentiate the positive sentiment and negative one from reviews as algorithm below.

**Algorithm 2: Reviews sentiment analysis ML model**

Input: corpus of normalized reviews [ ]

Output: trained machine learning model to predict sentiment from reviews (positive negative)

1. Build a bag of word (BOW) from corpus list
2. Divide BOW into training set and testing set
3. Train a machine learning classifier model
4. Calculate confusion matrix (CM)
5. End

Fig. 3. Sentimental analysis algorithm

This research also handles the sentiment analysis for the language, which has a specialty in the process because it's an oriental language. The word in the language contains the word's character and vowel diacritical marks that specify the pronounce of the character that formulates the word. The existence of vowel diacritical marks may cause under fitting for the machine learning system, so this vowel diacritical marks have to be removed in the normalization preprocessing, we can notice algorithm 3, its begin with read the review and unify the characters than contains vowel like marks diacritical and removing the noise (vowel diacritical marks) .Then complete the preprocess as it is done in English preprocessing by eliminating stop words and stemming each word in the normalized review.

**4. Output analysis**



Fig. 4. Login page

Fig 4. is the admin homepage, it include the following components Username and Password for we have used JavaScript for validation. It also has the additional components regarding About Us, Contact Details and Copyright.

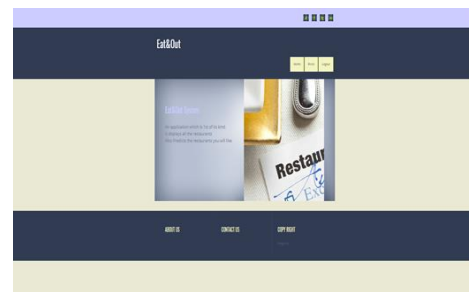


Fig. 5. Home page

In this webpage admin gets the option of adding, deleting and updating the different eat-out. Also the page contains the website description.



Fig. 6. Eat-Out dataset

Fig. 6. gives us the details of the Eat-Outs from the Database having fields like Eat-out ID, Description, Location, Owner name and Contact. This page contains the links to Add or Delete New datasets.



Fig. 7. Add New Eat-Out Webpage

## 5. Conclusion

The approach is to indulge a proposal that will overcome all the limitations and drawbacks of previous models existing in the market and will provide us with a better accuracy and more precise predictions that will customers find eat-outs of his choice with minimum hassle.

## References

- [1] Chen, Li, Guanliang Chen, and Feng Wang. "Recommender systems based on user reviews: the state of the art." *User Modeling and User-Adapted Interaction* 25.2 (2015).
- [2] Bobadilla Jesus, Fernando Ortega, Antonio Hernando, JesuS Bernal. "A collaborative filtering approach to mitigate the new user cold start problem." *Knowledge-Based Systems*, 26 (2012).
- [3] J. Herlocker, J. Konstan, L. Terveen, and J. Riedl, "Evaluating collaborative filtering recommender systems," *ACM Transactions on Information Systems (TOIS)*, vol. 22, no. 1, 2004.
- [4] Huming, Gao, and Li Weili. "A hotel recommendation system based on collaborative filtering and rankboost algorithm." *Multimedia and Information Technology (MMIT), 2010 Second International Conference on*. Vol. 1. IEEE, 2010.
- [5] Y. Moshfeghi, B. Piwowarski, and J. Jose, "Handling data sparsity in collaborative filtering using emotion and semantic based features," in *Proceedings of the 34th international ACM SIGIR conference on Research and development in Information*. ACM, 2011.
- [6] Kavinkumar, V., Rachamalla Rahul Reddy, Rohit Balasubramanian, M. Sridhar, K. Sridharan, and D. Venkataraman. "A hybrid approach for recommendation system with added feedback component." In *Advances in Computing, Communications and Informatics (ICACCI), 2015 International Conference on*, IEEE, 2015.
- [7] Zhang, Kai, Keqiang Wang, Xiaoling Wang, Cheqing Jin, and Aoying Zhou. "Hotel recommendation based on user preference analysis." In *Data Engineering Workshops (ICDEW), 2015 31st IEEE International Conference on*, IEEE, 2015.