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FEATURE-LEVEL RATING SYSTEM USING CUSTOMER REVIEWS AND REVIEW VOTES

RAMANATHI MAHIMA
PG Scholar, Department of M.C.A,
S.K.B.R P.G College,
Amalapuram, E.G.Dt., A.P, India.
E-Mail: mahimaramanathi91@gmail.com

Mr. NAGA. SRINIVASA RAO*
Asst. Professor, Dept of M.C.A,
S.K.B.R P.G College,
Amalapuram, E.G.Dt., A.P, India.
E-Mail:naagaasrinu@gmail.com

Abstract—
Various types of reviews are conjoined against product rating in an attempt to provide a comprehensive picture of the product for decision-making. This work starts with an analysis of grammar of reviews and review votes. According to its analysis, we can mathematically optimize a relevance measure of a review. The relevance is the summation of feature rating measures of reviews. Though product ratings is a generic summary of the product, feature ratings is a particular; we exactly know what is good or bad about the product. Different customers are interested in different features. For that reason, feature-level ratings provide decision-making context based on how the participants interacted with the product itself. We apply such information to analyze the votes given by customers on an online shopping site (Amazon) for mobile products. This analysis will provide ratings to product features a large collection used from various manufacturers around the world. It will help agents (from a manufacturer perspective) gauge how a product needs to be improved with better features to attract more buyers and (customers) interest.

Index Terms: **Cellular phones, decision-making, natural language processing, recommender systems, reviews, sentiment analysis, text mining, web mining.**

I. Introduction

The Internet rein has arrived and is ruling the needs of the human. From booking a flight ticket to ordering vegetables everything has a website or an application to make use with. In such vast and soon developing period, customers decision making ability is also getting effected. So, the main aim of any business website let it be with ecommerce, or a movie website is to provide the users with accurate information by using an efficient recommender system Recommender system is basically an algorithm used to provide the user or the customer an accurate suggestion of the product or a movie review/rating they have been looking for this is basically done in two different ways, one of which includes suggesting a relevant item based on the user's history which is his/her previous activity related to it (Personalized method). Another one is the non personalized method which can be described as the seasonal sale that is

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prediction based on stock availability. Many Recommender systems basically work on collaborative filtering. Collaborative filtering is one of the best method and a backbone method of today's social recommender systems. In this fast-growing era, there comes the problem of big data because of the growing users of the internet. So, to give an accurate prediction to the user, any recommendation technique used should search the whole database and find an accurate prediction, which is a typical task. Collaborative filtering works in a similar manner but in a different way, where the database search is done with respect to user's previous activities, find similarities with the other database by using suitable algorithms and then find a top prediction for the user. In this way, it also paves a way to a vast research area with many arising complexities. Improvising these methods will be a great advantage as this is used by many leading business websites like Amazon, Book my Show etc. When coming to the websites like book my show, it not only enables us to book movie tickets but also lets us know what rating it has gained. These ratings are given based on a individual's voting or opinion. But if we consider a case as an example where only a single user or a less number of users have given the review as good or above average, the overall review delivered would be a good or above average because only some users have rated it. In this way an accurate prediction is not delivered to the end user. So, this paper proposes a hybrid collaborative system, which calculates the movie overall review by comparing the individual's review based on previous activities, based on the comparison of the users with the others who gave similar ratings and compares the individual ratings to all other people's rating for the very same movie and ranks it based on Top 10, Top 20 and Top 50. The review is based on hot voting and cold voting where the hot voting is based on the user's participation in giving the rating and a cold user who rarely gives the review. We show that simple meta path-based NN models outperform computation-intensive MF models in hot-voting recommendation, while users' interests for nonhot voting can be better mined by MF models. Also, this paper proposes a method to know whether a user is likely to watch a movie or not based on the k-nearest neighbor algorithm.

II. LITERATURE SURVEY

ONLINE social networks (OSN), such as Facebook and Twitter, facilitate easy information sharing among friends. A user not only can share her updates, in forms of text, picture, and video, with her direct friends, but also can quickly disseminate those updates to a much larger audience of indirect friends, leveraging on the rich connectivity and global reach of popular OSNs. Many OSNs now offer the *social voting* function, through which a user can share with friends her opinions, e.g., *like* or *dislike*, on various subjects, ranging from user statuses, profile pictures, to games played, Manuscript received October 22, 2014; revised August 19, 2016; accepted January 24, 2017. Products purchased, websites visited, and so on. Taking like–dislike type of votings one step further, some OSNs, e.g., Sina Weibo [20], empower users to initiate their own voting campaigns, on any topic of their interests, with use customized voting options. The friends of a voting initiatorcan participate in the

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campaign or retweet the campaign to their friends. Other than stimulating social interactions, social voting also has many potential commercial values. Advertisers can initiate votings to advertise certain brands. Product managers can initiate votings to conduct market research. E-commerce owners can strategically launch votings to attract more online customers. The increasing popularity of social voting immediately brings forth the "information overload" problem: a user can be easily overwhelmed by various votings that were initiated, participated, or retweeted by her direct and indirect friends. It is critical and challenging to present the "right votings" to the "right users" so as to improve user experience and maximize user engagement in social votings. Recommender systems (RSs) deal with information overload by suggesting to users the items that are potentially of their interests. In this paper, we present our recent effort on developing RSs for online social votings, i.e., recommending interesting voting campaigns to users. Different from the traditional items for recommendation, such as books and movies, social votings propagate along social links. A user is more likely to be exposed to a voting if the voting was initialized, participated, or retweeted by her friends. A voting's visibility to a user is highly correlated with the voting activities in her social neighborhood. Social propagation also makes social influence more prominent: a user is more likely to participate in a voting if her friends have participated in the voting. Due to social propagation and social influence, a user's voting behavior is strongly correlated with her social friends. Social voting poses unique challenges and opportunities for RSs utilizing social trust information [14], [26], [28], [32], [34]. Furthermore, voting participation data are binary without negative samples. It is, therefore, intriguing to develop RSs for social voting.Toward addressing these challenges, we develop a set of novel RS models, including matrix-factorization (MF)-based models and nearest-neighbor (NN)-based models, to learn user-voting interests by simultaneously mining information on user-voting participation, user–user friendship, and user group affliction. We systematically evaluate and compare the performance of the proposed models using real social voting traces collected from Sina Weibo. The contribution of this paper is threefold.1) Online social voting has not been much investigated to our knowledge. We develop MF-based and NN-based RS models. We show through experiments with real social voting traces that both social network information and group affiliation information can be mined to significantly improve the accuracy of popularity-based voting recommendation.2) Our experiments on NN-based models suggest that social network information dominates group affiliation information. And social and group information is more valuable to cold users than to heavy users.

III. PROBLEM STATEMENT

Kumar R G et.al. developed sentiment analysis approach by using Bi-directional Recurrent Neural Network (BRNN) for telugu movies. Initially, tweets related to telugu movies were collected. Then, character trigram is used to solve the grammatical errors present in the sentences and morphological analyzer is employed for the vector representations. At last, the inputs are given to BRNN for the sentimental

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analysis of the reviews. The developed method represents the high and low resources in the same space and classified them on the basis of similarities among the annotated tags.However, the representation of texts and optimization method need to be effective to increase the performance of the sentiment analysis.

Limitations: Computation and communication overheads are very high

IV. MODULES

UPLOAD PRODUCTS

Uploading the products is done by admin. Authorized person is uploading the new arrivals to system that are listed to users. Product can be uploaded with its attributes such as brand, color, and all other details of warranty. The uploaded products are able to block or unblock by users.

PRODUCT REVIEW BASED ORDER

The suggestion to user's view of products is listed based on the review by user and rating to particular item. Naïve bayes algorithm is used in this project to develop the whether the sentiment of given review is positive or negative. Based on the output of algorithm suggestion to users is given. The algorithm is applied and lists the products in user side based on the positive and negative.

RATINGS AND REVIEWS

Ratings and reviews are main concept of the project in order to find effective product marketing. The main aim of the project is to get the user reviews based on how they purchased or whether they purchased or not. The major find out of the project is when they give the ratings and how effective it is. And this will helpful for the users who are willing to buy the same kind of product.

DATA ANALYSIS

The main part of the project is to analysis the ratings and reviews that are given by the user. The products can be analysis based on the numbers which are given by user. The user data analysis of the data can be done by charts format. The graphs may vary like pie chart, bar chart or some other charts.

Data Pre-Processing

The data were pre-processed in the first phase of the detection model. Pre-processing includes the transformation and normalization of data. To clean the dataset, URLs, retweets, mentions, and stop-words were removed from the dataset. Each row of the dataset was then tokenized by breaking the text into tokens or words. After that, the tokenized words were subjected to stemming and lemmatization. The stemmed input text was processed through the One-Hot procedure to extract features from these input words. The features were binary patterns that could be employed in the machine learning prediction model to predict depression (1 represents depressed, and 0 represents other words). The list of depressive sentences and words is represented, extracted from the dataset. Represents some depressive tweets taken from the dataset.

Features Visualization Using Principal Component Analysis.

We embraced a dimensionality reduction technique called PCA to visualize features.

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PCA performs decomposition using the covariance matrix to generate eigenvalues to minimize the inner scattering of samples and maximize inter-class scattering.

Modeling LSTM-RNN for Emotional State Analysis

While conversing with others, sentiments can be expressed as time-sequential sentences in textual data. Machine-learning models are pretty capable of encoding time sequential data. We implemented RNN because it is the most optimal method for working with sequential data. RNN comprises recurrent connections with past and present states and hidden states. Memory plays an essential function in neural networks and sometimes faces gradient disappearing problems. LSTM is the solution to memory processing-related problems.

V. CONCLUSION

We have developed a system to rate mobile phones in terms of 108 features based on customer reviews and review votes.We accomplish this by first converting the unstructured data into structured data; then, we extract the sentences comprising our feature keywords; then, we were able to provide the feature-level ratings through sentiment analysis of these sentences. We rank the phones based on the number of features that they are best at, and accordingly, we were able to recommend the best phones for a feature. We tested our methodology on the "phone" named feature by considering the overall customer ratings as ground-truth ratings. The performance of our method is found to be decent. We obtain MAE of only 0.555, i.e., approximately just half a star. We get 52.3% accuracy if exact integer ratings have to be predicted. However, if we can tolerate the one-star integer rating error, the accuracy jumps to 93.8%. The proposed approach is unsupervised. As an extension, we will work on improving the performance by taking a weakly supervised or supervised approach to this problem, for which we will have to annotate the available data in terms of all our 108 features

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