News Communication Recommendation Technology Based on LDA Model Improvements and Online Reviews

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Abstract. The cosine distance calculation method can effectively calculate the correlation degree of the news communication characteristics based on online comments, while the LDA model can set the threshold of the correlation degree, so as to predict the news emergencies through the subsequent news communication characteristics. In addition, select the largest user group and calculate the characteristic word weights of the user group, you can get the news communication recommendation results. Of course, it also needs to use the LDA model to input the user group feature word weights in the LDA model through the LDA model. Finally, simulation experiments demonstrate that the coverage of news communication recommendation techniques based on online reviews and improved LDA models is better than traditional news communication recommendation techniques.

Keywords: LDA Model · Correlation Degree Calculation · Potential Recommendation Model

1 Introduction

Common news communication recommendation technologies include news communication recommendation techniques based on content and collaborative filtering models, as well as news communication recommendation techniques that combine collaborative filtering models and content [11]. These three different news communication recommendation technologies all have disadvantages to different degrees [13]. For example, the news communication recommendation technology based on the collaborative filtering model cannot accurately identify the news needs of users and push the news that users are interested in to users [4]. Content-based news communication recommendation technology cannot recommend music or videos for users. Therefore, it is necessary to build news communication recommendation techniques based on online reviews and improved LDA models.

2 Online Calculation of News Communication Characteristics

To calculate the feature correlation degree, we first need to understand the emergency situation of online comment news communication. When the sudden news event, the

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relevant features may appear in the news of the same subject, [7] so we must follow the principle that the news communication characteristics and the emergency trajectory have the corresponding coincidence degree, and the news communication characteristics can overlap to some extent and the document where the feature track is located [15].

According to the above principle, the correlation degree of news communication characteristics can be found by the cosine distance calculation method. The formula is as follows:

$$sim(f_i, f_j) = \left| f_i b[t] - f_j b[t] \right| \tag{1}$$

Among them, f_i represents the news communication characteristics, f_j represents the burst trajectory of the news communication characteristic document, while b is the constraint, and the eigenvalue is t.

However, by using the news propagation feature correlation degree, assuming that D_i and D_j are the feature sets of f_i and f_j, then the minimum values of the sets f_i and f_j can be obtained as follows:

$$\min(f_i, f_j) = \min \sqrt{|D_i| - \left| D_j \right|} \tag{2}$$

After obtaining the minimum, the set optimal correlation degree of f_i and f_j can be obtained.

3 LDA News and Communication Recommendation Model

After calculating the correlation degree of the news communication characteristics, the correlation degree value can be obtained, [14]. But because the correlation degree itself is not accurate enough, it will have a certain impact on the recommendation results of the news communication. If the LDA model is operated through the cosine switching method, the accurate feature correlation in communication can be predicted in news propagation [6].

After obtaining the optimal correlation degree of the target user and other users by using formula (1), select the similar user group reasonably, and establish the characteristic word weight matrix to ensure the accuracy of the interest data of the target user, so as to establish the potential recommendation model of the target user [1] (Fig. 1).

Assuming that the target user similar user group is $U = (u1, u2, \cdots, ui)$, the target user is U and the user similarity is w, the feature word weight of the target user can be calculated in this model as follows:

$$w2_w = sim(f_i, f_i) + (U + w) \tag{3}$$

Build the recommended model with the following formula:

$$w3_j = sim(a, u) + \frac{w2_u}{U + a} \tag{4}$$

However, because of the diverse needs of the target users, the largest feature words need to be extracted in the model (Fig. 2).

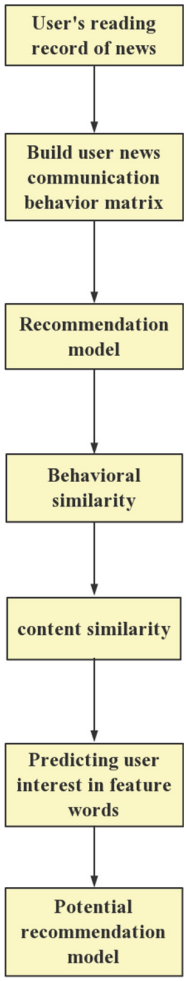

Fig. 1. Potential recommendation model for news communication of target users.

Create the recommendation results with the LDA model, and then calculate the formula of the LDA model with the cosine similarity, [10] we can get the results of the similarity of the sorted news communication text and the model, or the similarity of the news communication text and the model based on the previous feedback. Above, news communication recommendations based on online comments and LDA models are effectively implemented [8].

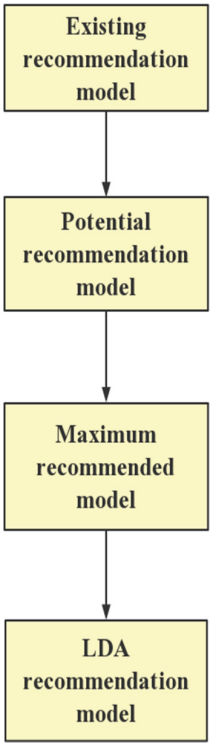

Fig. 2. The LDA news and communication recommendation model operation process.

4 Simulation Experiments

Comparison of experiments were established based on online reviews and LDA models, with the experimental procedure as follows.

4.1 Experimental Data

Data were provided by DataCastle, with 10, 000 users randomly selected at the same time period, as shown in Table 1.

In the process of the experiment, the above data need to be imported into the database to allow the data to be extracted later, [5] and then the recommended results are compiled in the Java language. By comparing the recommended results, the experimental index can be calculated using the LDA model.

4.2 Experiment Process

The dataset was divided into test sets and training sets for users with large news propagation, while the training set is the remaining users after the test set extraction [2]. Before the commencement of the experiment, ten sets of data must be drawn, each containing

Table 1. Dataset Details.

User number	News headlines	News communication content
5215421	Malaysia Airlines	Malaysia Airlines
5212623	U. S. A	NASA releases information
5216594	Caixin	Caixin
5213265	Malaysia	Street riots in Malaysia
5249895	Guang'an	Guang'an female lost contact
5231655	Shanghai	Shanghai free toilet paper
5213131	office worker	Continuous overtime

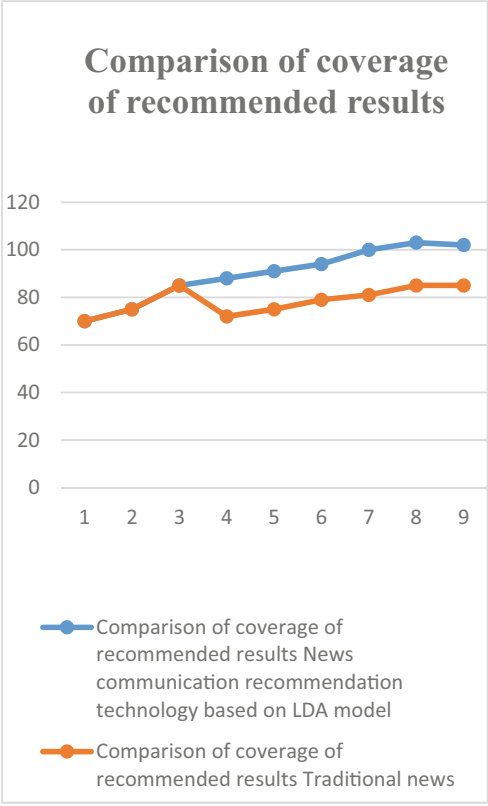

Fig. 3. Comparison of the coverage results.

news browsing records of 400 users. After obtaining the data, it is necessary to use the news communication technology of the LDA model to calculate it, [3] and the results are obviously different from the recommended results of the traditional news communication

technology. The experimental results are usually the average of the selected data. The larger the number, the higher the coverage of news transmission, and the better the effect of technical recommendation. Therefore, [16] it can be concluded that recommendation techniques based on online comments and improved LDA models are better.

4.3 Experimental Results

The figure can prove that news recommendation technologies based on online reviews and improved LDA models are better than traditional news communication recommendation technology, because they have less coverage than news recommendation technologies based on online reviews and improved LDA models [12]. This also suggests that news recommendation technologies based on online reviews and improved LDA models are more efficient and of some value (Fig. 3).

5 Conclusion

In the news recommendation techniques based on online comments and improved LDA models, this paper mainly selects the LDA models with two personalized functions, both of which can improve the coverage of news recommendation technologies to a certain extent. That's adaptive navigation and automatic recommendation, [9] two personalized features that make LDA models stand out from all kinds of news recommendation technologies. And in the process of actual technology application, you can see based on online comments and improve the LDA model of news recommendation technology of the main value and significance is to accurately establish the data set, and can detect different news emergency trajectory, real-time to meet the trajectory of news transmission characteristics, shall prevail, predict news emergencies. However, because the LDA model still has certain shortcomings, such as the user matrix is not accurate enough, and it does not consider the error between different times, which will also affect the coverage rate of news communication technology to a certain extent. Therefore, there is still room for improvement in news recommendation techniques based on online reviews and improved LDA models to be studied.

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