Trustworthy Movie Recommender System with Correct Assessment and Emotion Evaluation

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***Abstract*—This paper proposes the movie recommender system for providing trustworthy movie ratings. Most of the movie recommender systems do not consider the unfair rating problem but the emotion evaluation. Then our approach performs the correct assessment against unfair rating. Furthermore we should analyze the review comments from twitter and emotion evaluations of users. As a result, it is possible to provide the movie candidates which are adjusting to users' intentions in a timely manner.**

***Index Terms*— movie evaluation, emotion evaluation, correct assessment, movie, emotion**

I. Introduction

As above, Many assessment and recommendation systems of movies have been proposed. However, this paper filters out unfair rating data to provide accurate assessments. And it takes the user's expertise to give weight of the individual rating. First, it uses provided data by the Movielens. Also we analyze the review comments from twitter and emotion evaluations of users. Analyzed result is used to preference of movies. As mentioned above, this paper helps to meet the cultural life of the user with accurate assessments. Furthermore, we will be able to extend to the suitable movie recommendation system to users.

Many researchers performed movie recommendation approaches through analysis with watched movies. In case of the system excluded assessment against unfair rating, they were difficult to increase accuracy. Thus, we refined the rating data from unfair rating and analyzed expertise of movies in order to increase the trustworthy of the assessment and the users' satisfaction. In addition, the preference of the movies was analyzed with the comments from Tweeter and evaluated users' intentions.

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II. Procedure for Paper Submission

A. Movie assessment system based on emotion against unfair rating

1) Data Collection

The paper dealt the Movielens data set which consists of 100,000 ratings from 943 users on 1682 movies. The attributes of movie data are the movie ID, movie title, release date, genre movies in the 1682 individual ratings. Each user has been rating at least 20 movies. We could obtain the expertise and filter out unfair assessment with proposed approach. Furthermore we reflected the users' intentions with comments which are extracted by twitter4j.

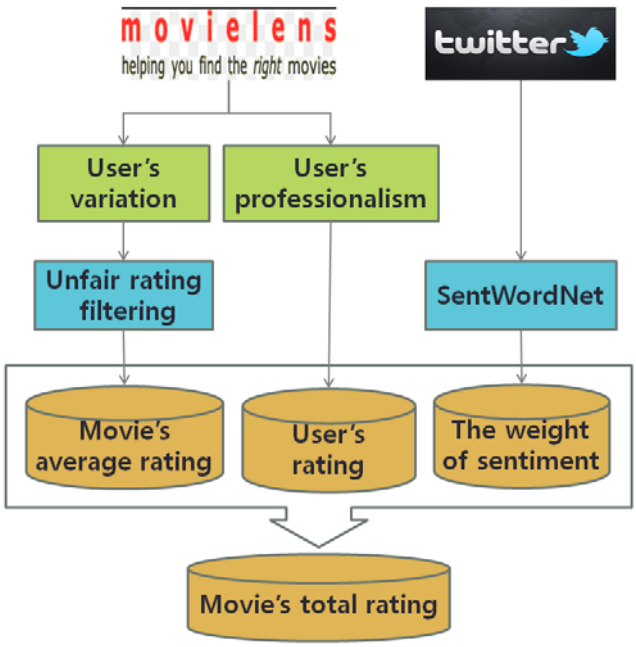

Fig. 1. Overview of the proposed Recommender System

2) Analysis of the collected data

a) Unfair rating filtering using a variation

Assessment of the person is hard to determine the objectiv e and accurate opinions if a person gives a rating to every mo vie as the same score. This rating pattern should so called un fair rating. The proposed approach filters out the unfair ratin g by using the variation of the film rating. The variance valu e of the user giving unfair rating is "0". So this study gives t he weight of his rating to "0". And the remaining non-unfair rating data is used the variation value by the weight value.

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b) Expertise measurement of movie genre

In this paper, we measure expertise about the movie genre of individual for providing accurate movie rating. The high professionalism means writing dependable data. In other words, the person having high professionalism is less likely to be evaluated unfairly. In this paper we measure the quantitative assessment and screening out the unfair rating which is proposed in [4]. And this study is also multiplied by the variance value on quantitative assessment. Result of variance value is up to 4 at least 0. So we added a 1 to remove a value between 0 and 1. Formula for measuring the expertise is as follows.

$$\Pr ofessionalism(P) = \frac{B}{A} \times \frac{1}{C} \times \frac{1}{Variance + 1}$$

A is the number of total rating evaluated, B is the number of same genre films evaluated, and C is the number of genre films evaluated. P value close to 1 for giving a rating is the kind of person who is expertise.

c) The weight using SWN

With the development of SNS, people were easier to share information and communicate with others. Therefore, the article of SNS has had a great influence on many people. In view of this point, [5] showed that the assessed comments about the movie affect movie selection of people.

With this in mind, this paper has collected reaction of the public using a twitter4j. We analyzed the preference of movies through collected popular tweets and SWN (**S**enti**W**ord**N**et). SWN has included a total of 147 278 English words, belonging to nouns, verbs, adjectives, and adverbs.

SWN has a positive, negative, objective emotional value.

The results obtained using the SWN are normalized from 0 to 2. The maximum value among the positive, negative, neutral value is reflected in the movie preferences. The weight range was defined as follows.

$$\begin{array}{ll} \text{positive value} & 1 < x \le 2 \\ \text{negative value} & 0 \le x < 1 \\ \text{neutral value} & x = 1 \end{array} \quad (1)$$

By adding one to the value of positive gives weighting. In addition, if the value of the neutral is to define the weight value of one. In case that the weighted value multiplied score calculation, when the value is positive and increased. Also, when the value is negative, this is small. Finally, when the value is neutral, this is maintaining.

3) The final rating about movies

First, this paper filters out unfair rating using the individual movie rating provided by Movielens. Then, we multiply the value about professionalism and the weight obtained through SWN.

$$W = \frac{V}{A} \times \frac{1}{C} \times \frac{1}{Variance + 1} \times SWNvalue \quad (2)$$

It shows the results of two. The first is the rating for the movie provided by the Movielens. And the second is the rating using the formula above.

The three variables in this formula were used.

$$TotalRating = \frac{\sum_{i=1}^{Max(i)} BasicRating(i, j) \times W(i)}{k} \quad (3)$$

where i is the number of users, j is the movie ID, and k is expressed the number of users who evaluate the j-th movie. In this paper, accurate ratings were expressed by the final formula and the data provided by Movielens.

III. Conclusion

This paper suggested the movie assessment system based on emotion against unfair rating. The proposed approach was used with data provided in Movielens. We calculate the variance value to the rating data for the movies. This paper was given the variance to the weight for unfair assessment in order to show the trustworthy movie assessment. In addition, we conducted a quantitative evaluation that divided by the movie's aspects and the users' aspects with user's expertise measurement.

We collected opinions about the movie from Twitter in order to reflect the user's emotions, and we analyzed them and reflected in the evaluation. This paper will be able to provide a high recommendation system based on the trustworthy movie assessment system.

num	movie_title	movie rating	refine movie rating
1	EntertainingAngels : The Dorothy Day Story (1996)	5.00	5.205882353
2	The Innocent (1994)	3.00	3.101535128
3	When Night Is Falling (1995)	3.40	3.483504528
4	Letter From Death Row, A (1998)	4.33	4.404813777
5	Tough and Deadly (1995)	3.00	3.065264977
6	Lamerica (1994)	3.75	3.815040701
7	Tokyo Fist (1995)	4.00	4.064759849
8	Cyclo (1995)	3.00	3.062195122
9	Someone Else's America (1995)	5.00	5.061787072
10	Aiqing wansui (1994)	5.00	5.06079478

Fig. 2. Experimental Results with the proposed Approach

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