

Recommendation a Micro-Video System based on Weighted Slope One Algorithm

Prof. Jayaprabha .M. Kanase¹ Mangesh More² Ronak Mutha³ Hemang Patil⁴ Pushkar Waghchoure⁵
^{1,2,3,4,5}Department of Computer Engineering
^{1,2,3,4,5}PESMCOE, SPPU Pune, India

Abstract— Trending Technology and development of Internet services shows how micro-video is becoming a new face especially for youth. However, many users face difficulties to get proper micro-videos from amount of videos on the Internet. Many websites today use Recommender Systems that give personalized recommendations of items to a set of different users. Therefore, thus paper proposes a micro-video recommendation system. The core of this system is recommendation algorithms. The purpose of this paper is to implement an algorithm that should be easy to implement, be effective on query time and accurate on recommendations. Slope one recommendation system is a simplified but enhanced version of linear regression and can be used to recommend items. This paper uses Weighted Slope One technique which is an alternation of Slope One. User must at least have rated two items in order to receive a recommendation of the implementation.

Keywords: Micro-video; Recommendation system; Slope One; Weighted Slope One

I. INTRODUCTION

Information media has a new form as Micro-video. Micro-video[1] is a short time video which lasts for 30 seconds to 300 seconds. Teenagers prefer to watch the micro-video on their confetti time through mobile devices. Therefore, this paper proposes a micro-video recommendation system (MRS). The system can analyze the user’s favorites and watching history, automatically push appropriate video to users.

A recommender system [5] is a mechanism that is supposed to accurately suggest some sort of item to the user. These items suggestions could for example be movies on Netflix, advertisements on Google or products on Amazon that user may find appealing. A proper recommendation system will give an accurate recommendation. For recommendation of micro-videos the data could be created out of many factors like genre, ratings, history, etc. Here, this paper focuses on ratings given by users on specific micro-video.

These are 3 approaches for designing the mechanism. They are Content-Based Filtering (CBF), Collaborative Filtering (CF) [4] and Hybrid Recommender System (HRS). The Slope One algorithm is the type of CF and can be used for recommendations. As it is fundamentally based on linear regression, it is named as Slope one. The Weighted Slope one [5], which takes the relevancy of items into the calculation is an alternation of Slope one. This paper will focus on the regular Slope one and the weighted alternation [5].

II. SYSTEM ARCHITECTURE

In this system user gets to see initial micro-videos [2] and recommended micro-videos after authenticated user login.

Home Page is displayed after user login. Home Page displays micro-videos from several categories. User must rate the micro-videos after watching it. Ratings given by user are stored in database table. The datasets of this database table consists of attributes in the form - (User id, Video id, Ratings).

Here, we are using Slope One recommendation algorithm which is the part of Collaborative Filtering[6] based recommender system. This algorithm calculates the predicted ratings of micro-videos and according to ratings, the recommendation of proper micro-videos is done.

In this system, we create Login Page using HTML and CSS. Home Page and respective pages are designed using JSP and Servlet.

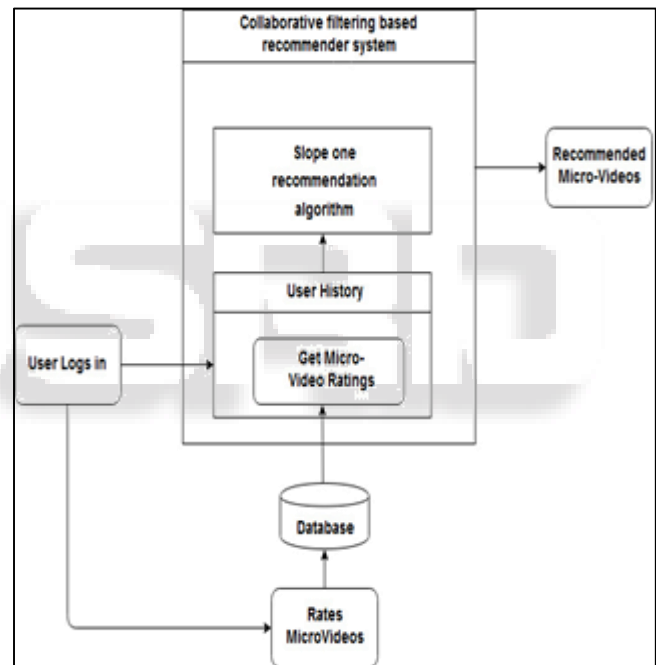


Fig. 1: System Architecture

For storage of ratings, we use sql database table. For implementation of our core algorithm we use Java platform. As our main module is in java, the connectivity used is jdbc.

A. Modules

- 1) Dataset Generation
- 2) Predicting (calculating) ratings for videos
- 3) Visualization

1) Dataset Generation:

In this module, we code the functionality of taking ratings from videos he watched from different categories of micro-videos.

2) Predicting Ratings for Videos:

The working of this module is done in 3 phases.

- 1) Computing average rating difference: Here, we calculate the average rating difference between pairs of video ratings.

- 2) Computing the weight between videos: In this phase. We compute the weight between micro-videos, the algorithm has to count the number of users that has rated both micro-videos
- 3) Computing weighted slope one: To calculate a prediction we use the Weighted Slope One Formula.

$$P'(u)_j = \frac{\sum_{i \in S(u)-j} ((dev_{j,i} + u_i) * c_{j,i})}{\sum_{i \in S(u)-j} c_{j,i}}$$

Where $C_{j,i}$ is the number of relevant items in the set S , and is considered to be the weight.

3) Visualization:

In this module, we display the recommended micro-videos to user. User display screen provides recommended micro-videos to user according to their category.

III. MATHEMATICAL MODEL

Let 'S' be a system having Input (I), Function (F) and Output (O). It can be represented as,

$$S = \{I, F, O\}$$

Where,

I is data set of User Id, Micro-Video Id and Ratings

$$I = \{\text{UserId, Micro-VideoId, Ratings}\}$$

O is predicted ratings.

F is the set of functions used for recommendation.

$$F = \{F1, F2, F3\}$$

F1 is a function to compute the difference matrix D_{ij} for each user.

F2 is a function to compute the average difference.

F3 is an Item Based Slope One Collaborative Filtering.

$$P'(u)_j = \frac{\sum_{i \in S(u)-j} ((dev_{j,i} + u_i) * c_{j,i})}{\sum_{i \in S(u)-j} c_{j,i}}$$

Where,

- $P'(u)_j$ is the prediction of item j .
- $((dev_{j,i} + u_i) * c_{j,i})$ is a prediction of $(u)_j$.
- $C_{j,i}$ is the number of relevant items in the set S , and is considered to be the weight.

This is Weighted Slope one formula used to calculate a prediction. It is the final phase of working of core algorithm.

IV. CONCLUSION

How to find a favorite video is the challenge we are facing nowadays. Based on this spot, this paper proposes a micro-video recommendation system. According to the viewers browsing, watching and rating videos, this system can recommend the favorite micro-videos to the viewers. Users can give ratings easily on user interactive front end. Appropriate recommendation of micro-video is given to the user by making efficient use of Slope one algorithm. Weighted Slope one gives better accuracy than regular Slope One. Thus, this system uses Weighted Slope one algorithm for implementation. Hence, user gets proper recommended micro-video according to category selected based on highly rated micro-videos and he/she can further rate the micro-video after watching it for further better recommendation.

REFERENCES

- [1] A Micro-video Recommendation System Based on Big Data. Songtao Shang, Minyong Shi, Wen-qian Shang, Zhiguo Hong. IEEE Computer Society, ICIS-2016.
- [2] A Survey on Micro Video Recommendation System Based on Big Data. Suman Kotin, Prasad gouda Patil, International Journal of Innovative Research in Technology, IJIRT -2018.
- [3] Design and Implementation of Recommendation System on Micro-Videos Topic, Dongdong Jiang, Wenqian Shang , IEEE Computer Society, ICIS-2017.
- [4] Evaluating and Implementing Collaborative Filtering Systems Using Apache Mahout.G. R. Bam-note, S. S. Agrawal, International Conference on Computing Communication Control and Automation-2015.
- [5] An Recommendation Algorithm Based on Weighted Slope One Algorithm and User-Based Collaborative Filtering, WANG Panpan, QIAN Qian, SHANG Zhenhng, LI Jingsong, Chinese Conference and Decision Conference(CDCC),2016
- [6] S.Y.Song, K. J. Wu, A creative personalized recommendation algorithm-User-Based Slope One algorithm,2012 International Conference on Systems and Informatics(ICSAI 2012), p.p. 2023-2027, 2012