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A Survey on “User Search Recommendation System for Videos”

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ABSTRACT: Video is one of the most talked about items in the recommendation systems community. Video recommendation system provides users with suitable videos to choose which is considered an effective way to get higher user satisfaction. Ever since the Netflix Prize contest for movie recommendations, there has been growing interests in building good video recommenders. Video recommendation can be treated as key user engagement driving feature for any text or multimedia driven service, be it content or search oriented. A good video recommender system not only increases the user engagement but also increase the revenue by making it possible to show more advertisements. Different from Content-Based Filtering, Collaborative filtering recommends movies according to similarity of users or videos. The main aim of this application is to improve the accuracy and provide faster recommendations using M-distance algorithm as well as traditional methods

KEYWORDS: Video recommendation, Collaborative Filtering, Content-based Filtering, Pearson’s Correlation Coefficient, User Rating, M-Distance.

I. INTRODUCTION

The goal of our recommendation system is to provide personalized recommendations that help users find videos relative to their interests and obtain them consistently. In order to improve the degree of user satisfaction, it is imperative that these recommendations are provided in real-time and reflect user’s recent activities on the site. This requirement prevents us from generating recommendations by pre-computation that is adopted in many works, because pre-computed recommendations cannot reflect user’s recent activities. Instead, we compute new recommendations for users in real-time for each user request. Video recommendation system provides users with suitable video to choose which is considered as effective way to get a higher user satisfaction. We are also going to consider the attributes such as mouse hover, video watching time, ratings given to the videos and recommend accordingly.

II. RELATED WORK

In some of the earlier researches, the system used content based filtering algorithm for recommendations, in which according to the users browsing history some features are extracted and summarized from which the similar results are recommended to the user therefore only those videos which were preferred in the past are recommended [6]. While some researchers used content based filtering with collaborative filtering in which they assume that the content information is already rated [4]. While in further researches, collaborative filtering algorithm was used which recommends similar videos and is based on user to user and item to item filtering which consider that similar minded

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people. When collaborative filtering with Tag Information is used, the previous history or ratings of the users are considered which is not available all the time [2]. In some systems collaborative filtering with KNN (k-Nearest Neighbour) is used in which data normalization, neighbour selection and determination of the interpolation weights is calculated and from which the videos are recommended [5]. We are going to use the traditional algorithms along with M-Distance algorithm which gives Fast Recommendations [1].

Collaborative Filtering Recommendation Algorithm	Description	Advantages	Disadvantages
User-based	It is used to predict the target user's future activity by combining past activity of similar user's.	It is easy to implement.	It has sparsity problem due to which the accuracy is slow. Suffers scalability problem
Item-based	It is similar to the user-based algorithm except that it determines item or product similarity instead of user activity.	Provides better performance and quality, less computation, high efficiency and is faster than user based algorithm	It is slow for large number of items.
Dimensionality-Reduction algorithm	This algorithm compresses original matrix of information and produces recommendations based on the compressed data by applying standard singular-vector decomposition (SVD).	Simplifies the sparsity problem.	It has the highest runtime among the other two algorithms.

Table 1. Comparative Analysis of Collaborative Filtering Recommendation Algorithm

Recommendation Strategy	Advantages	Disadvantages
Content based Recommendation	It recommends as soon as there is information available about the items. Hence, user independent transparency is present. No Cold Start problem.	Limited content analysis.
Collaborative based	It does not require content about users or items. It can produce personalized recommendation.	It is fully dependent on user ratings. It demonstrates poor accuracy when there is little data about user's ratings.

Table 2. Comparative Analysis of Recommendation Strategies

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III. SYSTEM ARCHITECTURE

The input to our system will be taken from users browsing profile. The user browsing profile will include Mouse Click, Mouse Select, Particular video playing time, Mouse Hover and Genres Search. The dataset will be created on the following browsing profiles of the user. Then the system will generate factor table based on some parameters like mouse moments, user activities and the rating for the videos given by the other users. The timings for the factor table will be based on the user behaviour which is done by tracking the user activities like which video he watched, mouse hover moment and the video statistics.

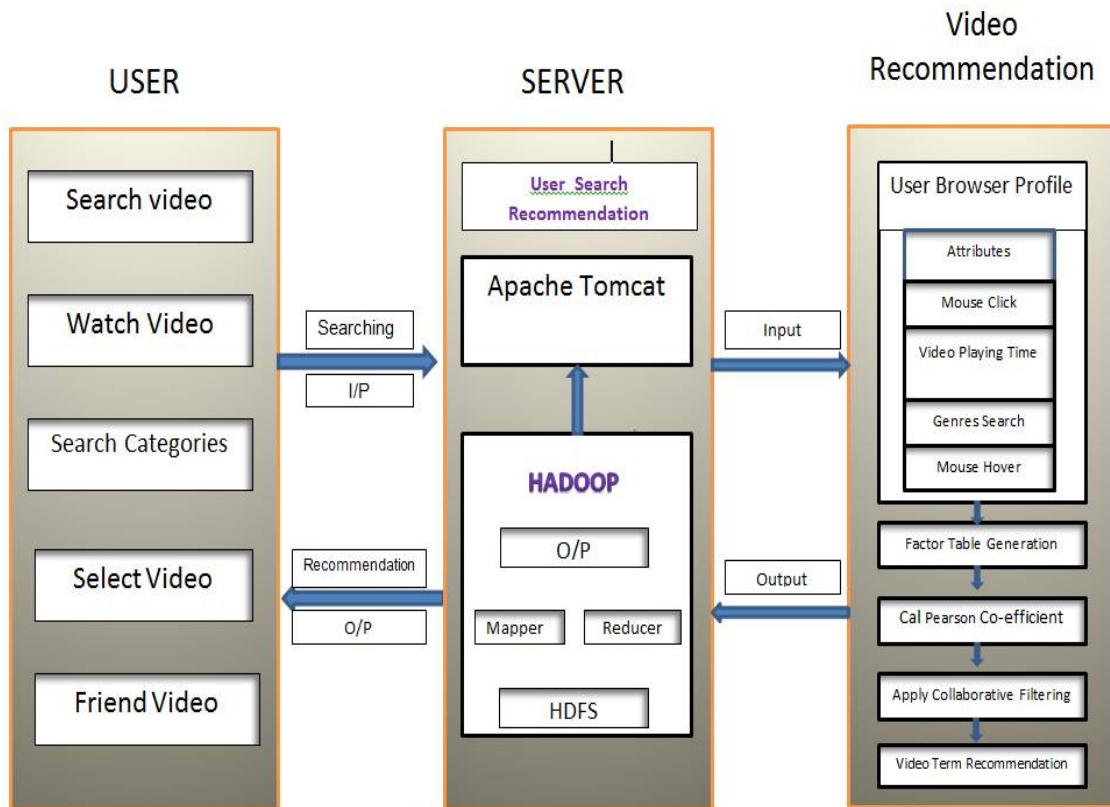


Figure. Architecture diagram of the proposed system

Once the factor table is generated the system calculates the Pearson's Correlation Co-efficient on the genres by taking its average value generated by the factor table which will be in Matrix Form. On the basis of the factor table attributes, Pearson's co-efficient returns the output parameters i.e. users having similarity between them. Then collaborative filtering algorithm along with the M-Distance algorithm which yields fast recommendation is applied on the available data to provide video recommendation to the user. Thus, by using user and item based Collaborative filtering along with M-Distance algorithm, the application will suggest the videos to user.

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1. User Browser Profiling

Create the dataset on the following attribute:

- Mouse Click
- Mouse Select
- Particular video playing time
- Mouse Hover
- Genres Search

2. Factor Table Generation

Generate factor table based on some parameters like mouse moments, user activities and the rating of videos given by the other user. Considered the timings for factor table on the user behaviour by tracking the user activities like which video he watched, mouse hover moment and the video statistics.

3. Calculate Pearson Co-efficient

Once factor table is generated calculate the Pearson's Co-efficient on the genres by taking its average value

$$r = \frac{\sum_i (X_i - \bar{X})(Y_i - \bar{Y})}{\sqrt{\sum_i (X_i - \bar{X})^2 \sum_i (Y_i - \bar{Y})^2}} \quad (1)$$

Where X_i and Y_i are the ratings of the users for the videos (i).

4. Apply Collaborative Filtering

On the basis of the factor table attributes the system calculate the Pearson's co-efficient and returns the output parameters which are used for collaborative filtering, then we match the result with user profile and provide video recommendation.

- Video Search
- Delta (Δ) time. Means Video watching time
- Category Search
- Mouse Events (Click, Select, Hover)

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IV. CONCLUSION

The huge amount of data and the computational power is needed to bring accurate results in a recommender system. These constraints should be considered while applying on online or even an offline recommender system. In this application we are using the collaborative filtering along with M-Distance algorithm for the recommendations of videos. Thus, the objective to provide users with more precise and accurate recommendations is full-filled. With proper recommendations the user interactions with the application increases and users get what they like with better precision. Hence, an easily available and a better solution providing a noteworthy experience to the users for video viewing is provided increasing user stickiness with the application.

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