



Movie Recommendation System Using Machine Learning

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Abstract: Movies play important role in our life. It is one of the source of entertainment that we see in our day to day life. Which movie we really like to watch it depends on people, either it is comedy, romantic, action, adventure etc. But the problem is to find the appropriate content, because every year a lot of contents has been released. So, it is very difficult to find our favorite movie. The aim of this project is to enhance the performance and accuracy of the regular filtering technique. There are various methods which are used to implement a recommendation system. In this paper Content-based filtering and Collaborative filtering methods are used. The Content-based filtering method is takes input from the users, analyze the user's history/past behavior and recommend a list of similar movies. In this paper, K-NN algorithms and collaborative filtering are also used to intensify the accuracy of result. In this paper, cosine similarity is used to find the similar content quickly. The cosine similarity is used as the accuracy of cosine angle. By all of this, People can find their favorite movie content easily.

Keywords: Movie recommender system, content-based filtering, collaborative filtering, cosine similarity, KNN algorithms, Hybrid recommendation system, SVD Algorithm.

I. INTRODUCTION

Recommendation system is anticipation technique which is used for information filtering, where it tries to foretell the users preference. These systems are widely used today in different areas such as movies, books, music, food, videos, places etc. In this paper Movie Recommendation is use. There are distinct types of numerous movies are launch every year. Movies like horror, action, animated, adventure etc. So, In these abundant stocks of movies content people facing difficulty to find out their favorite movie content. So, the Movie Recommendation System help us to search our preferred movies very easily and reducing the time consuming process.

In the past, people used to shop in a physical store. In which the availability of items are limited. For example, The number of movies that can be placed in a store is limited. But, nowadays, people access abundant materials online. But, later the availability of information is increased. So, a new problem arose. The problem is more time is wasting to find out the favorite movie of people. This is where the recommendation system comes in.

There are several methods of recommendation systems. Collaborative filtering, Content-based, hybrid recommendation system. In Collaborative method the large amount of information has been collect and analyze on user's behaviors, preference and predicting what users will like based on their similarity to other users. The Content-based method takes the information of users as an input to find out the similar movies.

The goal of this paper is to construct the Movie Recommendation System that examine the previous movie ratings predetermined by various users to provide suggestions to the user.

II. LITERATURE REVIEW

Many recommendation systems have been made over the years. Authors developed and implemented these systems using various big data and machine algorithms.

- **Movie Recommender System Using Collaborative Filtering, Proceedings of the International Conference on Electronics and Sustainable Communication Systems (ICESC 2020)**: Authors developed movie recommendation system using collaborative filtering. K-NN algorithms is used to enhance the accuracy of results, at the same time removing the drawbacks of the content-based filtering. Authors also compared the existing systems to show that the system is more accurate and reliable.
- **Movie Recommender System Based on Percentage of View, 5th Conference on Knowledge-Based Engineering and Innovation, Iran University of Science and Technology, Tehran, Iran**: A percentage of view approach is used to recommend movies to the users. The approach is used in a recommendation system for a media service provider named Namava. An Implicit Opinion Measure (IOM) improves performance of system on implicit feedback. Proposed system is works 5 times better than a random recommendation.
- **Movie Recommendation System Using Collaborative Filtering, 2018 IEEE 9th International Conference on Software Engineering and Service Science (ICSESS)**: Apache mahout is used to implement the movie recommendation system. The system takes into consideration the ratings given to the movies and provides movie suggestions. Further Research indicates that hybrid systems are more effective and provide more accurate results. Apache Prediction 10 is a Machine Learning Server that uses Elastic Search and Apache Hbase.
- **A Content-based Movie Recommender System based on Temporal User Preferences, 2017 3rd Iranian Conference on Signal Processing and Intelligent Systems (ICSPIS)**: A content based movie recommendation system is developed. Authors used a temporal preference model of the user to recommend movies. The method is then evaluated using Movie Lens dataset.
- **An Improved Approach for Movie Recommendation System, International conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC 2017)**: Author combined the content based filtering and collaborative filtering to improve the quality of the movie recommendation system. Author used support vector machine as a classifier. Author proposed hybrid approach and also compared the results with the existing pure approaches.

III. SYSTEM ARCHITECTURE OVERVIEW

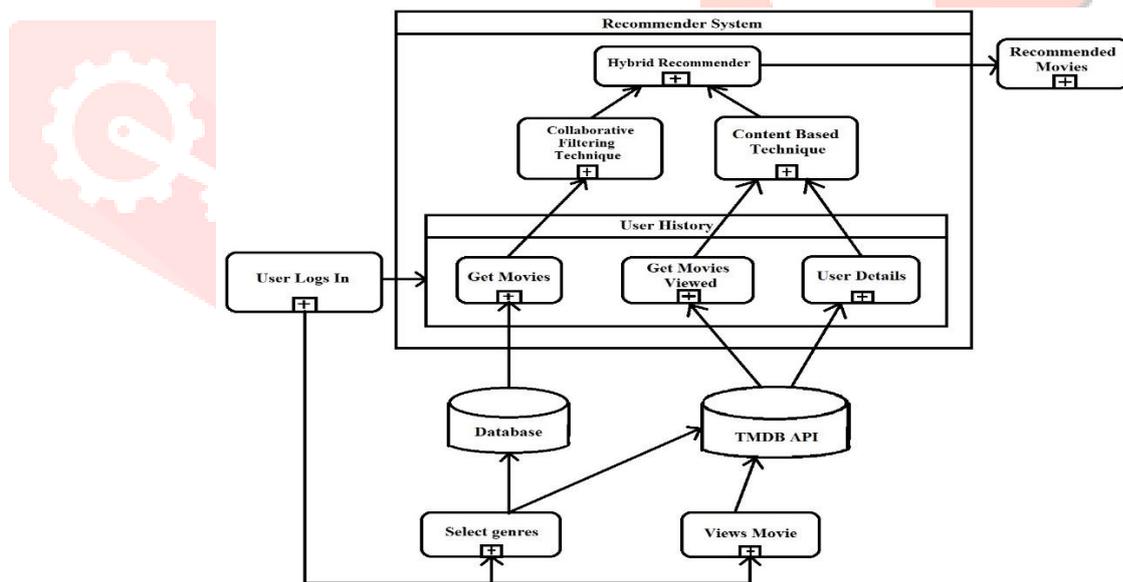


Figure 1: System Architecture

The above figure refers to the movie recommendation system. In this system user gets login and can browse the different movies available in the database. Also user can save his/her preferred genres of movie to get the more personalized movie contents. The given preferences of the user are get processed by several machine learning algorithms and different techniques like Collaborative Filtering and Content-Based Filtering to get the more personalized recommendations. Also user can see the details of movies like Star Cast, Ratings, Reviews. In Collaborative method the large amount of information has been collect and analyze on user's behaviors, preference and predicting what users would like based on their similarity to other users. The Content-based method takes the information of users as an input to find out the similar movies. Singular Value Decomposition (SVD) algorithms used gives more accurate results as we are using MovieLens dataset of 25 million ratings applied to 62,000 movies by 162,000 users. KNN collaborative method using Cosine similarity is also applied to get the similar recommendations.

IV. MATHEMATICAL MODEL

System Description:

$$S = (I, O, F)$$

Where,

- S: System.
- I = { M } are set of Inputs

Where,

M: Movie Name

- F = { C } are set of Function

Where,

P: Preprocessing

- O = { O1, O2, O3 } are set of Output

Where,

O1: Movie Details

O2: Movie Reviews

O3: Movie Recommendations

- Success Conditions :
Movies List, Movie Details, Movie Recommendations.
- Failure Conditions :
No database, Internet connection, Invalid Movie Name.

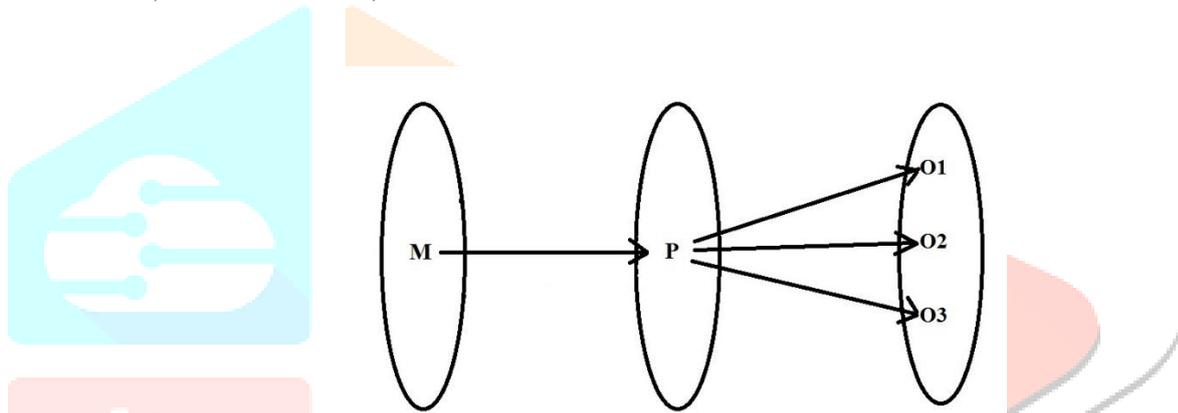


Figure 2: Venn Diagram

V. CONCLUSION

In this paper, the Collaborative Filtering and Content-Based Filtering both techniques are combined which makes the system hybrid and minimizes the error of finding the good recommendations. KNN collaborative method using Cosine similarity gives similar results and SVD also gives the more accurate results as the dataset of 25 million ratings applied to 62,000 movies by 162,000 users is provided to the system. These methods used gives more accuracy and efficiency to the system. In the future, more feature can be included to make the system more accurate. Also various different algorithms can be applied for improvement of the recommendation system.

VI. REFERENCES

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