



INTELLIGENT MOVIE RECOMMENDATION SYSTEM USING AI AND ML

Ajinkya Satuse¹, Omkar Bhalerao², Pavan Pawar³, Hrithik Thorat⁴

D.S. Hirolkar⁵

^{1,2,3,4} Student, Department of Information Technology,

⁵ Professor, Department of Information Technology

^{1,2,3,4,5} Pune District Education Association's College of Engineering, Manjari Bk., Pune, India.

ABSTRACT

A recommendation system is a system that, depending on a data set, makes recommendations to users for specific resources such as books, movies, songs, and so on. Typically, movie recommendation systems anticipate what movies a user would enjoy based on the characteristics of the User and previously provided data. Such recommendation systems are useful for businesses that collect data from a big number of clients and want to deliver the best recommendations available. Many elements can be taken into account while creating a movie recommendation system, such as the film's genre, the actors, the story, and even the director. The systems can propose movies based on a single attribute or a combination of two or more. The recommendation system in this paper is based on the tags created by combining genre, actors and description that the user may choose to watch. We have adopted a Content-based filtering technique in our project. A recommendation engine uses several algorithms to filter data and then recommends the most relevant items to consumers. If a user visits a movie site for the first time, the site will have no previous history of that user. In such cases, the user can search for their favourite movie genre or director to get a similar recommendation.

KEYWORDS: Movie Recommendation Systems, Content-Based Filtering, Movie recommendation, machine learning project.

I.INTRODUCTION

With the ever-increasing demand for machine automated solutions, machine learning has become one of the rapidly increasing and evolving technology. In the era of the 21st century and increasing E-commerce over the Internet, online shopping and entertainment are on peak levels.

Online everything will be new normal in the upcoming decade. Imagine you are shopping online on websites like Amazon.com, they have a million products for sale and the same goes for Flipkart and other e-commerce websites. Entertainment websites like Netflix and Hotstar have over 10 million movies and series to be watched. If you want anything specific from Amazon you can search it, but what about the rest? If you want something similar or better than your search results, it will be like searching for a golden tree in the jungle of trees. You will be lost and will never find your way out of the jungle. That's where Recommendation systems can help you. Recommender system can become your ally in such platforms. Similarly, Recommendation System plays an important role in becoming your guide in the systems of Amazon, Netflix and other e-commerce websites. Without a recommendation system, they will be a database and you will need to be sure of what you're looking for. It will be great for Amazon and Netflix if people don't buy their products or don't watch any movie.

Therefore, companies need it more than anything in upcoming years. That is the reason we decided to learn recommender systems and take it to next level.

Recommendation Systems are mostly used to assist consumers in receiving customised results based on their choices. Recommendation Systems can also be used as a filtering strategy to select the best result from a set of anticipated results using a Machine Learning algorithm.

Movies can be segregated on basis of genres like thriller, animation, comedy, action, drama etc. Another way to categorize movies is based on some metadata such as cast, year of release, language or director. Nowadays, most online video-streaming platforms provide a number of similar types of tv shows and movies to the user by the help of utilizing users previous search keywords and previous watch history of the user. The main goal while building a Movie Recommendation System is to make it reliable and efficient to provide suggestions to users accurately what they are looking for. Normally, Recommendation Systems are divided into three different types – Collaborative or User Filtering, Content-Based Filtering and Hybrid filtering.

II.METHODOLOGY

1. Requirement/Data Gathering:

Data is the most important and foundation for machine learning projects. Gathering data from various datasets is key for a recommendation system. The more the data available the better the recommending results.

2. Pre-processing:

In the pre-processing stage, Filtering and making ready the data for the project, we will make some changes such as, we will build tags that will describe the data and help us to calculate its similarity with other data.

2.1 System designing:

In this system design phase, we design the system which is easily understood by the end-user i.e., user friendly.

We design some UML diagrams and data flow diagrams to understand the system flow and system module and sequence of execution.

3. Model implementation and testing:

We will create a framework of data that will coordinate with the code this phase involves the core part of our project that is coding and model designing. The model will make sure the project works well at the local level.

The different test cases are performed to test whether the project module is giving the expected outcome in the assumed time.

4. Website designing:

After we have created a working model, we will create the same into a website. This stage will involve designing an immersive UI.

5. Deployment of System:

Once the functional and non-functional testing is done, the product is deployed in the virtual environment or released into the local hosting like Heroku, over the internet.

III.MODELLING AND ANALYSIS

Types of Recommendation System:

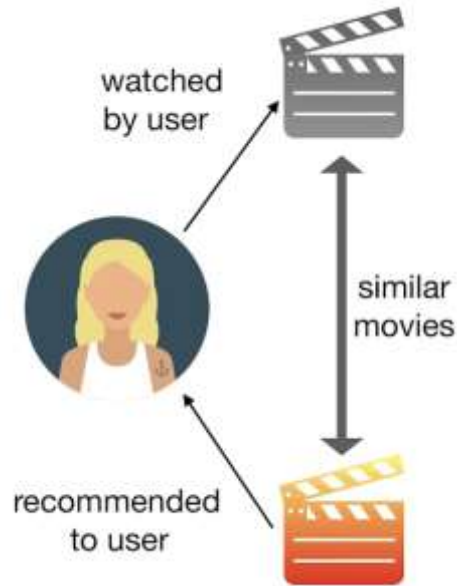
The recommendation system is usually classified on rating estimation

- [1] Collaborative Filtering system
- [2] Content-based system
- [3] Hybrid system

Content-based Filtering Systems:

As the name suggests, a content-based recommender system recommends by the similarity of the content or the product. In a content-based recommender system, the similarity between the content or the product is calculated to find similar content.

For example: If you want to watch an action movie, The system will recommend and list the movies which are related to action.



We have used the cosine similarity method to calculate a numeric value, that calculates the similarity among other movies. The cosine similarity function calculates by independent of magnitude and it is easy to calculate. Mathematically, it is defined as follows:

$$\text{similarity} = \cos(\theta) = \frac{\mathbf{A} \cdot \mathbf{B}}{\|\mathbf{A}\| \|\mathbf{B}\|} = \frac{\sum_{i=1}^n A_i B_i}{\sqrt{\sum_{i=1}^n A_i^2} \sqrt{\sum_{i=1}^n B_i^2}}$$

To implement the recommendation process these are the following steps:-

- Get the movie's index based on its title.
 - Get a list of cosine similarity ratings for that movie compared to all other movies.
- Convert it to a tuple list, with the first member being the position and the second being the value. the score of similarity.
Get top 5 similar results and display.

As our project has done a fine job of verifying movies and recommending similar movies by calculating similarities between tags, this system is not strong enough to be recognised as a Perfect recommendation system. If a person searches for "The Avengers". The system returns all movies related to Avengers movies while it is more likely that the people who liked that movie are more inclined to enjoy other Marvel Movies. This is the result captured by our current system.

IV. RESULTS

Movie Recommender System

Group B Movie recommendation system

The Avengers

Show Recommendation

Avengers: Age of Ultron



Captain America



Iron Man 3



Captain America



Iron Man



V. CONCLUSION

- [1] The recommendation systems can be enhanced for present and future requirements for increasing the quality and for better recommendation results.
- [2] Recommendation system can become your virtual guide on E-Commerce platforms when powered with AI
- [3] It will be a great loss for companies like Amazon and Netflix if people don't buy or don't watch their product
- [4] With the ever-increasing demand for machine automated solutions 'ML' has become one of the rapidly evolving technologies along with AI and Data Science.
- [5] Recommender systems will be used in the future to predict demand for products, connect buyers and sellers and eventually become the backbone for the supply chain.
- [6] Mega companies like Amazon, Netflix and Facebook need recommendation systems now more than anything. With increasing products and users.

VI. REFERENCES

- [1] Mahesh Giyani and Neha Chourasia "A Review of Movie Recommendation System: Limitations, Survey and Challenges"
- [2] Nirav Raval, Vijayshri Khedkar "Moviellaborative Filtering Based Moive Recommendation System"
- [3] Bhusan K. and Sripant "Recommendation System: Literature Survey and Challenges.
- [4] R. Sandeep, S. Sood, and V. Verma, "Twitter sentiment analysis of real-time customer experience feedback for predicting growth of Indian telecom companies," in Proceedings of the 2018 4th International Conference on Computing Sciences (ICCS), pp. 166–174, IEEE, Phagwara, India, August 2018.
- [5] Bilge, A., Kaleli, C., Yakut, I., Gunes, I., Polat, H.: A survey of privacy-preserving collaborative filtering schemes. Int. J. Softw. Eng. Knowl. Eng. 23(08), 1085–1108 (2013) CrossRef Google Scholar.

- [6] Calandrino, J.A., Kilzer, A., Narayanan, A., Felten, E.W., Shmatikov, V.: You might also like: privacy risks of collaborative filtering
- [7] Research.ijcaonline.org
- [8] Dataset : tmdb-5000-movies dataset.
- [9] Documentation: sklearn and streamlit

