Developing Smart ML Based Recommendation System *

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Abstract. Sometimes, music plays an important role in our life. Whether you are sad or happy, music plays an important factor as it expresses your mind, also the importance of music in your life will depend on your personal experience. This Recommendation System is developed for those users who express their feeling and prefer listening as well as viewing music videos depending on their choice. The recommendation system will filter out the contents depending upon user choice with similar data. For this Recommendation System, two techniques are used which are Collaborative Filtering and Content-based filtering. Considering the issues for some users while searching they can play music with help of a voice assistant.

Keywords: Content-based Filtering · Collaborative-based filtering · Hybrid Filtering · Recommendation System · Music App · Smart System · Machine Learning · Video Recommendation · Voice assistant

1 Introduction

For some people, music has an important role in life. Music is one of the solutions for many problems as it enhances mood, can make excited, can also feel relaxing and calm. Basically, it helps you from reducing stress, depression, pain. Considering the rapid development of mobile devices and the internet has made it possible to get more closer to the music by music player system. The reason behind most portable music systems is that music can be played whenever and where ever. The increase in the number of music available exceeds the listening capacity of a single individual. Therefore it is sometimes difficult to choose from millions of music. The solution for this issue is that there should be a good recommender system that can provide user music recommendations. This system will basically recommend music to users according to analyzing the most popular, highly rated and users preference this will help users to get personalized results. By considering all factors we are developing a smart recommendation

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system that will be convenient for music listeners as well as there would be an increase of audience in the music field. This Smart recommendation system is an advancement to the basic music player as it can recommend music to users by personalizing according to their choice and demands. Besides recommending music audio, this system also provides a recommendation of videos for 'now playing' music i.e While listening to the music, the music player screen while also provides a recommendation of music in video format. To make it more convenient voice assistants would be integrated with this smart recommendation system to have a hand-free experience. This System even helps out those users who are unable to type manually by using Voice Assistant. Voice assistant is basically implemented to have a hands-free experience for users. Voice-assistant would also result to recommend music on basis of the user's request.This would be beneficial for those are busy in other activities and wish to have music played simultaneously. In this Recommendation System, the resulting Recommendation is be provided based on audience preference or request. Besides this, the system will also recommend music based on categories like Latest Music, Top Hit Music that will introduce users to new music. For processing, this recommendation machine learning algorithms need to implement. This algorithm helps to instruct the data set and provide desirable output depending upon the specific algorithm used. The most common approach towards recommendation systems has been the Content-based Technique and Collaborative Technique. Most of the recommendation systems use collaborative filtering techniques as recommended music based on a community of users, their preferences, and their browsing behavior. Whereas in Content-Based filtering is a technique in which music is recommended on the basis of users' similar preferences and by knowledge accumulated of the user by studying users' recent played, favorite music, search music, etc. Besides recommending music this system will also provide video recommendations i.e while playing music the system will also provide Video option recommendations which will be useful for those users who want to play videos instead of audio, this can be implemented by navigating users to another page which will view video content. Another feature of the smart recommendation system is integrating the system with voice assistants. Voice-Assistant will also act as an interface for some users. This feature would be useful for those users who are willing to work simultaneously while playing music, which means that requesting voice assistant through command would give results. Basically, voice assistance is integrated to have a hand-free experience.

2 Objective

2.1 Compatibility

To develop a Cross platform application, i.e Developing single application that can be run on different operating system.

2.2 Feasibility

To build a hand-free mobile application by integrating it with Voice assistant,which can make application more convenient.

2.3 Regularity

To keep a track of frequently played music by user.

2.4 Usability

To provide recommendations based on recorded information of users' preferences and suggesting video link of played music so that even videos can be watched.

2.5 Serviceability

To deliver a set of playlist from analyzing the current and future popularity of music ,artist and genres.

3 Literature Review

3.1 Video Recommendation System Based on Human Interest

In year 2019 author Shainee Jain,Tejaswi Pawar, Heth Shah,Omkar Morye and Bhushan Patil, has published paper Video Recommendation System Based on Human Interest.
This system is develop for teenager user who are likely to watch videos on mobile. This paper proposes a video recommendation system that collects the reaction of the users for various videos which helps to know its relevance. Based on the viewers' watching history or browsing, the system is capable of recommending videos to the users. In this system Hybrid System is used which combination of Content Base filtering and Collaborative filtering.

3.2 Music Recommendation using Collaborative Filtering and Deep Learning

In year 2019 Anand Neil Arnold and Vaira Muthu S has published paper Music Recommendation using Collaborative Filtering and Deep Learning.
This Music Recommendation system recommends user music as well as videos depending on user preference. Here Collaborative filtering is used in which existing history of the user and recommends music from other user's history which are similar.

3.3 Artificial Intelligence-based Voice Assistant

In the year 2020 S Subhash, Prajwal N Srivatsa, S Siddesh, A Ullas Santhosh B publish paper Artificial Intelligence-based Voice Assistant. This system is basically an intelligent personalized assistant which can perform mental tasks like turning on/off smartphone applications with the help of the Voice User interface (VUI) which is used to listen and process audio commands. For this, the PyCharm library was installed from python packages. As a result, this system gives output on voice commands like playing songs on video, searching any location, and google search output.

3.4 Music Video Recommendation Based on Link Prediction Considering Local and Global Structures of a Network

In this literature the authors Yui Matsumoto; Ryosuke Harakawa; Takahiro Ogawa; Miki Haseyama publish the paper in the year 2019 which was Music Video Recommendation Based on Link Prediction Considering Local and Global Structures of a Network in this system they have implemented a novel method based on LP-LG SN for recommending music and videos. In this, they have the construction of a network by collaborative use of the multi-model feature. As a result, it can work well in real-world applications. In the future, this application will introduce a framework to fuse prediction which can control the effect of local and global structure-based

3.5 FARMER'S ASSISTANT using AI Voice Bot

In the year 2021 authors Kiruthiga Devi M; Divakar M S; Vimal Kumar V; Martina Jaincy D E; Kalpana R A; Sanjai Kumar R M published a paper titled FARMER'S ASSISTANT using AI Voice Bot. The main purpose of this application is to develop a mobile application that can assist farmers depending on two techniques voice bot and suggestion bot. The multi-language response was generated depending on the farmer's queries. These queries were responded to by a multi-linguistic bot which was implemented using Google translator,pysttsx3, and Google search engines. This mobile application can improve increase in agriculture production and suggest farmer for progress in better farming practice.

4 Problem Definition

- Music Industry has experienced a boom in recent years due to the rapid increase in Music listeners.

- The number of music available exceeds the listening capacity of a single individual.

– It is sometimes difficult to choose from millions of music. However to manage this user needs a recommendation system which can help their user to introduce new music by giving quality of recommendation.

– Our system is developed as a music recommendation system that can give recommendations based on similarity and rating features.

– Along with the music recommendation, a video link will also be provided for those users who are willing to even watch music in video format.

– To make more innovative Voice assistants is integrated which offers a productive and personalized experience for users.

5 Proposed System Architecture

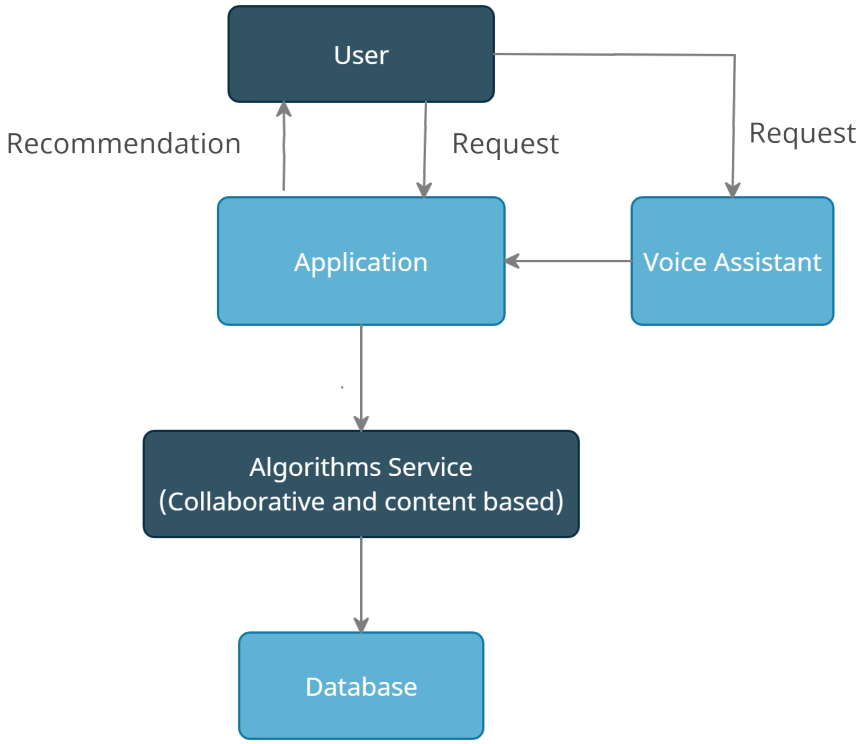

Fig. 1. Proposed System Architecture

The main goal of our application is to recommend users with the latest, preferred, and previously played music along with the video link. This is can be implemented by applying machine learning filtering algorithms which are collaborative and content-based filtering. This algorithm provides music based on user history and by collecting other user preferences. Recommendation is achieved on bases of hybrid recommendation technique Following are the modules which are been considered while implementing this application.

5.1 User

The user module is the targeted module that will request recommendations by interacting with the application or with a voice assistant to get music recommendations.

5.2 Application

This module is the main interaction with the user module which consists of a main application wherein music is recommended and played according to the user. This is a module where the user interacts the most to get recommendations.

5.3 Algorithms Service

This module consist of a Machine learning mechanism is which will recommend music by using algorithms like content-based and collaboration filtering.

5.4 Database

This module consists of a collection of user details and a music playlist which would be pushed towards user's dashboard depending upon the algorithm.

5.5 Voice assistant

This module is implemented to perform hand-free use of application wherein user can command to assistant and assistant future send the request to the application.

6 Summary

By applying the knowledge and skill set, we are determined towards building a completely user interactive system that would be useful for every music listeners. This project will be implemented as a cross-platform application that will be compatible with multiple operating systems. So we have proposed a recommendation system with hybrid technique using ML. This system will recommend music to users depending upon preferences, recently played, and ratings of other users. Along with the music recommendation, a video link will also be suggested for those users who are interested to watch music in video format. To make it more innovative Voice assistants are integrated which a hand-free and personalized experience to users.

7 References

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