Music Player with a Difference

Atharva Deshmukh[1], Barkha Chhbaria[1], Riya Wadhwani[1], Sharmila Sengupta[2], Parth Mangtani[1]

[1]Student, Computer Engineering, VESIT
[2]Associate Professor, Computer Engineering, VESIT

Publication Info

Article history:
Received : 13 February 2020
Accepted : 09 May 2020

Keywords:
Cross-platform, music recommendation, Collaborative filtering, File transfer protocol

Corresponding author:
Parth Mangtani
e-mail: *2017.parth.mangtani@ves.ac.in*

Abstract

The motivation regarding this paper is to create an environment for music lovers where they wouldn't be dependent on the internet all the time.
The basic functionality of the application includes playing songs of multiple music formats, adding songs to a playlist, rating songs, filtering songs, etc.
Optional functionalities include getting correct song metadata using APIs and playing songs not included in user libraries using APIs which doesn't require internet to function
The convenience of the user is prioritized by providing a music recommendation system. This system analyses user behavior and music tastes and starts recommending new songs that are not in the user's library. This means the user is suggested multiple songs of users' liking.
Also as the app is available on multiple platforms the music library is shared across all user devices using File Transfer Protocol, along with all other user data. It also periodically scans the library for changes and syncs the changed files.

1. INTRODUCTION

Cross-platform music player is a web application that works across multiple systems. It automatically syncs the data without any manual efforts. Basically this application provides ease to the user and saves the efforts. The basic functionality of the application includes playing songs of multiple music formats, adding songs to a playlist, rating songs, filtering songs, etc.

One of the popular personalization technologies powering the adaptive web is collaborative filtering. Collaborative filtering is the process of filtering or evaluating items through the feedback of other people. Collaborative Filtering technology brings together the feedback of large interconnected userbases on the web, supporting the filtering of substantial quantities of data. As the number of songs increases day by day it is difficult for users to find their favorite music. Calculate the Mel frequency cepstral coefficient [2]feature quantity by analyzing the characteristics of music content. Then the feature quantities are clustered to compress the music feature values. Finally, the distance metric function is used to calculate the similarity between all music in the feature value database of the searched music. The closer the distance is, the higher the similarity is according to the similarity, the result of the recommendation is obtained. The method recommended results have higher accuracy in experiments and provide an idea for music recommendations when user data is missing.

Today's Music recommendation systems considerably help users to find interesting music in these huge catalogs, music recommendation systems research is still facing substantial challenges[1]. In particular, when it comes to build and incorporate recommendation strategies that take into account data beyond simple user-item interactions or content-based descriptors but dig deep into the very core of listener needs, preferences, and intentions. Music recommendation system research becomes a big endeavor and related publications quite sparse. With the collaborative filtering techniques[5] becoming more and more evolved, recommender systems are widely used nowadays. However, the utilization of the recommender system in academic research itself has not received enough attention. Development of effective methods for search and retrieval, in particular, content-based preference elicitation for music recommendation is a challenging problem that is effectively addressed by a system that automatically generates recommendations and visualizes a user's musical preferences[3], given her/his accounts on popular online music services. The system retrieves a set of songs preferred by a user and computes a semantic description of musical preferences based on raw audio information. Collaborative filtering is the most well-known approach. However, existing approaches generally suffer from various weaknesses. Sparsity can significantly degrade the performance of the traditional collaborative filtering. The topic model-based collaborative filtering

2010-2019 S-JPSET : Vol. 12, Issue Supplementary-1, ISSN : 2229-7111 (Print) and ISSN : 2454-5767 (Online)

method is proposed to facilitate comprehensive points of interest [4] recommendations for social users. In this approach, user preference topics, such as cultural, city, or landmark, are extracted from the geo-location constrained textual description of photos via the author topic model instead of only from the geo-location. Advantages and superior performance of our approach are demonstrated by extensive experiments on a large collection of data but in order to implement that feature a lot of user data needs to be collected and continuous internet connection is required. Also, a lot of server-side processing is required which significantly increases the cost of implementation.

2. PROPOSED WORK

Music Recommendation is done using the Collaborative filtering Technique which is a technique that can filter out songs that a user might like on the basis of frequency at which they are played. It works by searching a large group of songs and finding a smaller set of playlists with tastes similar to a particular playlist. It looks at the items they like and combines them to create a ranked list of suggestions. There are many ways to decide which users are similar and combine their choices to create a list of recommendations. Music can be synced across multiple platforms and correct the metadata of the songs. Song recommendation is done offline using collaborative filtering from a pre-existing dataset.

As shown in Figure. 1 recommended music is given through the current playing song using collaborative filtering.

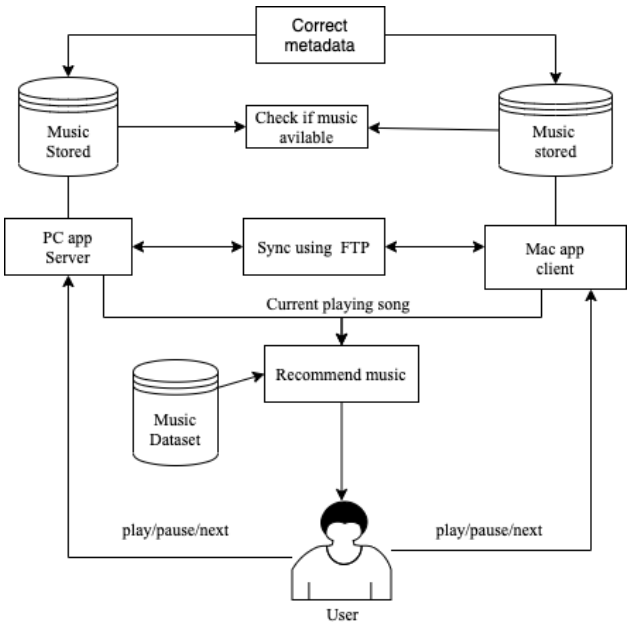

Fig. 1 User block diagram

3. METHODOLOGY

A web application is being created using various protocols like a File

Transfer Protocol is used for syncing music libraries and like a collaborative filtering Technique which is used for recommendation systems on a predefined data set.

There are two datasets used here the first is songs which the user is playing and the other is where information is gathered regarding the song names, song id and frequency of that particular song so the system can recommend the user accordingly. In the user database the song_id acts as a foreign key which is the primary key for the first database.

The use cases as shown in Figure. 2 which allows the user to control music and how it is going to play, it also gives cross-platform functionality across different devices and FTP features of the music player.

4. RESULTS

The GUI is made feasible and simple for the user. The main functionality of the application in Figure 3 is offline music

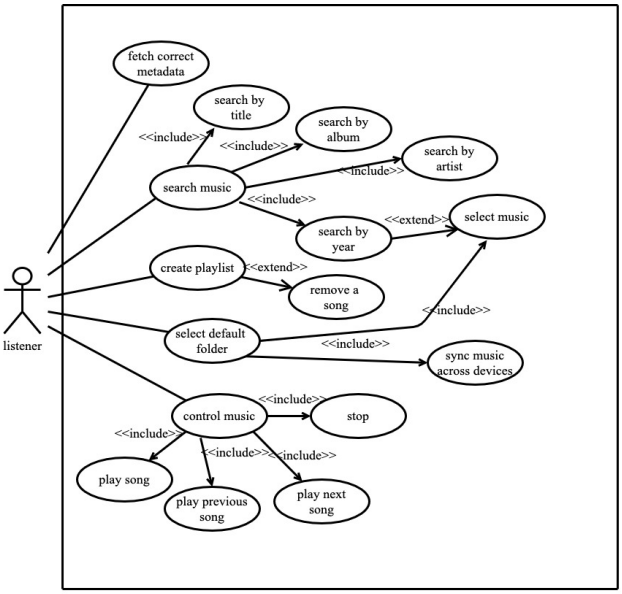

Figure 2: User Interface Diagram

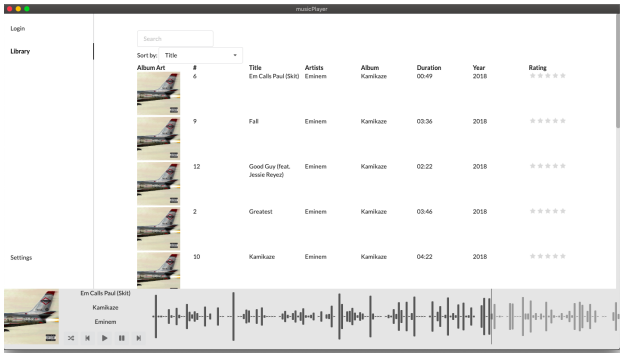

Figure 3: GUI of the music player

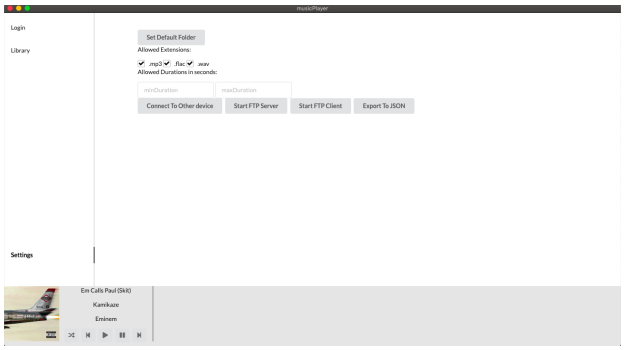

Figure 4: GUI of Music Settings

recommendation in this system you can play the next song and it will be played from the recommended list.

The waveform pattern in the music playing bar is the actual waveform of the loudness of the music so the user can know when the vocal part of the music is there. There is also a star-based rating system built in our application. The user is also able to sort the tracks according to album, artist, duration, star-rating and year of release. The playing bar is displayed in the bottom where you can skip, go back, pause, play, shuffle and got to the next recommended track. Album art is displayed in the same bar.

In Figure 4 we have the settings menu of the application in this menu we have the option to change the default folder and allow the format of music we want to be played. We also have the ability to sync music via FTP. Here we also have the option to allow music files that are of particular duration only to be displayed.

5. CONCLUSION

The idea of this music player would reduce the effort of the user to maintain a music library across various devices. Further machine learning can be implemented in order to recommend music according to the mood of the user using simple questions that will be answered by the user.

6. REFERENCES

[1] Schedl, M., Zamani, H., Chen, C. et al., “Current challenges and visions in music recommender systems research,” International Journal of Multimedia Information Retrieval vol.7, 95–116, 2018.

[2] H. Han, X. Luo, T. Yang and Y. Shi, "Music Recommendation Based Feature Similarity," 2018 IEEE International Conference of Safety Produce Informatization (IICSPI), Chongqing, China, pp. 650-654,2018.

[3] D. Bogdanov, M. Haro, F. Fuhrmann, A. Xambo, E. Gomez and P. Herrera, "A content-based system for music recommendation and visualization of user preferences working on semantic notions," 2011 9th International Workshop on Content-Based Multimedia Indexing, Madrid, 2011, pp. 249-252, 2011.

[4] S. Jiang, X. Qian, J. Shen, Y. Fu and T. Mei, "Author Topic Model-Based Collaborative Filtering for Personalized POI Recommendations," in IEEE Transactions on Multimedia, vol. 17, no. 6, pp. 907-918, June 2015.

[5] Chenguang Pan and Wenxin Li, "Research paper recommendation with topic analysis," 2010 International Conference On Computer Design and Applications, Qinhuangdao, 2010, pp. 264-268, 2010.

[6] John Canny,” Collaborative filtering with privacy via factor analysis,” in Proceedings of the 25th Annual International ACM SIGIR Conference on Research and Development in Information Retrieval, pp. 233-245, 2002.

2010-2019 S-JPSET : Vol. 12, Issue Supplementary-1, ISSN : 2229-7111 (Print) and ISSN : 2454-5767 (Online)