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Moodify – Music Player Based on Mood

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Abstract - Our face is a vital organ of our body, especially it plays a vital role in extracting an individual's behaviour as well as emotional state. If we segregate the playlist manually then the list of songs & generating a proper playlist based on an individual's emotional features becomes very difficult [8], consuming a lot of time, labour-intensive and upheld task.

There are many algorithms that have been developed and proposed to automate the song's playlist to generate the process. However, the proposed existing algorithms that are in use have been computationally slow, low accuracy and also sometimes it even requires the use of add-on hardware like a sensor.[10] So our proposed system is based on one facial expression which is then extracted, and it will generate a playlist automatically which will reduce the efforts and time taken to render the process manually.

Thus, our proposed system will tend to decrease the processing time which is involved in obtaining the overall cost and the result of our designed system, It will increase our overall accuracy of the system. Testing of this system is done using both user-dependent (dynamic) and user-independent (static) datasets. Our Face expressions are captured using an inbuilt camera in the system. Hence the proposed algorithm will take very little time to create/generate one emotion-based music playlist.

It will provide better accuracy to us in terms of performance as well as processing/computational time hence it reduces the designing cost, compared to the other algorithms which are used in the literature survey. Implementation and testing of the proposed algorithm is carried out using an inbuilt camera.[9] Hence, the proposed algorithm reduces the overall cost of the system successfully.

1.INTRODUCTION

Music is also known to have a profound effect on both emotions as well as our body. As we do know that the information of online music resources continues to grow day by day, it becomes really difficult for users to find out their favourite music. So, accurate & efficient music recommendation becomes very important.

When it comes to Music recommendation it is a research hotspot in the field of speech processing. The work on it describes us the working of Emotion Based Music Player, which is meant for users to minimize their efforts in managing large playlists. Usually, users have a large number of songs on their playlists. Thus, to avoid the trouble of selecting a song, most users will just randomly select a specific song from their playlist so some of the songs that will be played may not be appropriate according to the current mood of the user[5] so it may disappoint that user. So as a result, some of the songs will not match the user's present emotions. Moreover, no such commonly used app will play a song based on the user's current emotion. Our proposed model will not only be able to extract the user's facial expression but also be able to determine the current mood of the user.

Once the user's emotion is detected, a playlist of available songs suitable according to the mood of the user will be presented to him.

It aims to provide a better enjoyment for our music lovers while listening to songs. The system involves image processing and facial detection processes. Facial expressions are known to be the oldest and most natural form of expressing one's feelings, emotions & moods.

It is also more convenient to all the users if a music player will be able to detect a person's mood and then play songs automatically based on his/her mood instead of just the user manually checking for Songs on his/her device.

2. LITERATURE SURVEY

A]Title:- Emotion-Based Music Player [4]
Authors:- Krittrin Chankuptarat, Raphatsak Sriwatanaw orachai, Supannada Chotipant Jagannath Aghav.
Publication Journal & Year:- IEEE, 2019.

Summary:- This application detects facial photo by using a device camera. It will then use a classification method to recognise the user's emotion. So, this application returns a song that will be similar to the user's current mood. These experimental results show us that the proposed system will be able to accurately classify the happy emotion as we know that the heart rate range for this mood or emotion is wide.

B]Title:-Facial Expression Based Music Player. [5]
Authors:- Sushmita G. Kamble, A. H. Kulkarni.
Publication Journal & Year:- IEEE, 2016.

Summary:- Different expressions of a user are detected by extracting the facial features using the Euclidean Distance classifier algorithm and PCA algorithm. An inbuilt camera will be used to capture users facial expressions. Songs are then suggested to the user according to expressions.

C] Title:-HeartPlayer: A Smart Music Player Involving Emotion Recognition, Expression and Recommendation. [7]
Authors:- Songchun Fan, Cheng Tan, Xin Fan, Han Su, Jinyu Zhang.
Publication Journal & Year:- Springer, 2011.

Summary:- Usually, when you play a song, an animation figure expresses the emotion of the song by certain facial expressions. Meanwhile, the emotion of the song item is calculated according to the music features retrieved by the program that is running in backstage. In GUI, we use six colors to indicate the six classes of songs that have different emotions.

3. PROPOSED SOLUTION

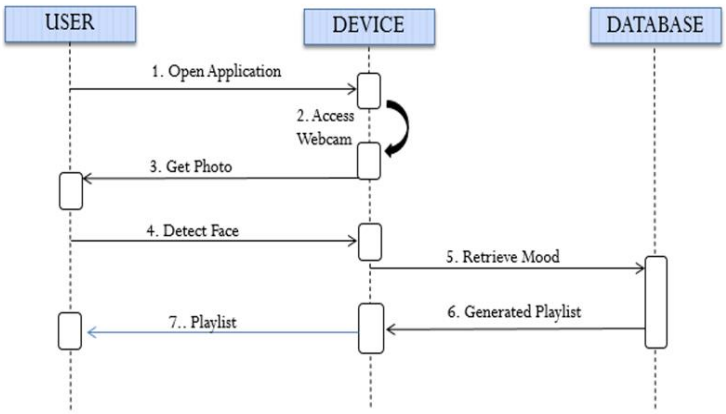


Figure-1: Sequence Diagram

Many applications based on Emotion detection ,and playing song according to the users Mood has been seen. However, the majority of applications do not provide all of these functionalities.

All of these characteristics have been included into this system. Once you open the app's main screen, the users face will be detected from the device webcam. A photo is captured of the user , then it detects the face and based on his/her mood the mood recogniser recognises and retrieves the mood of the user accordingly and then plays the song that best suits his/her mood [8].

The Sequential Diagram [Figure-1] workflow is explained as follows:-

Step1:-The user opens application
Step2:- The device activates its camera
Step3:- The device gets the photo of the user
Step4:- The user's face is detected by the device.
Step5:- The device retrieves the mood from the database
Step6:- A generated playlist is selected from the database and is sent back to the device.
Step7:- The device then plays the song for the user.

Our application detects 4 moods according to which songs are played. These are

1.Happy [Figure 4]
2.Sad [Figure 3]
3.Angry [Figure 5]
4.Neutral [Figure 2]

4. METHODOLOGY

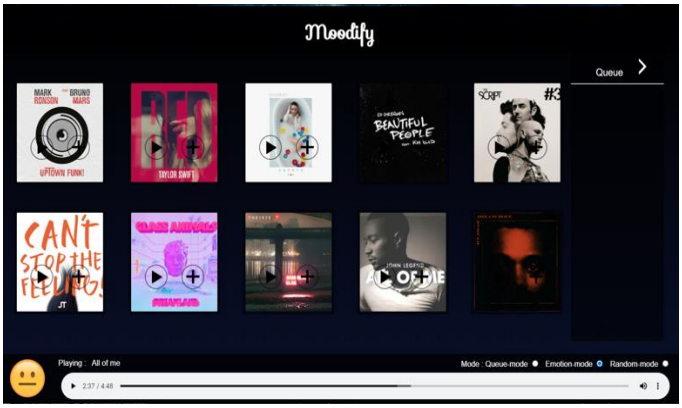
While training, We had used Fisher-face which is a method of cv2 library. For training data model we have make a python code that grabs all of the classified images from folders and map it with its emotion. At instance these data were stored in a dictionary so we then use the .train method with which we train model.

Basically to save our model for later usage we have also implemented .save method. While detecting for the first time we have a load model in our memory using the .read method. Also the predictions of our result is based on the confidence & predictions value which the .predict method will return.

Haar cascade model It is basically a precise face detection model that is trained which is provided to us by Open-cv. It returns the co-ordinates in terms of (x, y) at (left, bottom) of face frame and it's width and height from those co-ordinates. In the .detectMultiScale() method which can detect multiple faces and also in return of an array of faces(co-ordinates) as an element. Also these arguments have set according to our threshold what we need for according to checking purpose. We had set it in such a way that it will not impact our models accuracy.

5. RESULTS

Following are the screenshots of the interface and output of the proposed system.



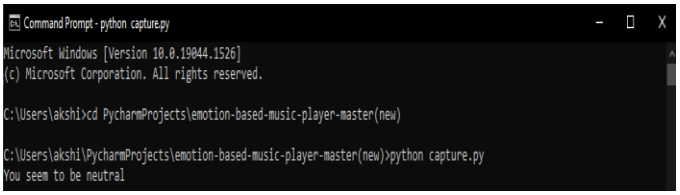
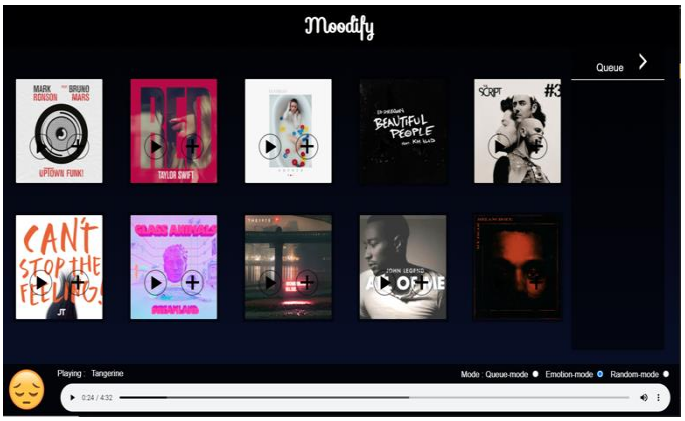


Figure 2: Case Neutral
The emotion of the user has been detected as neutral



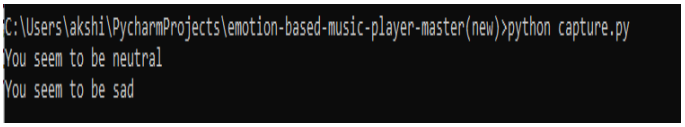


Figure 3: Case Sad
The emotion of the user has been detected as sad

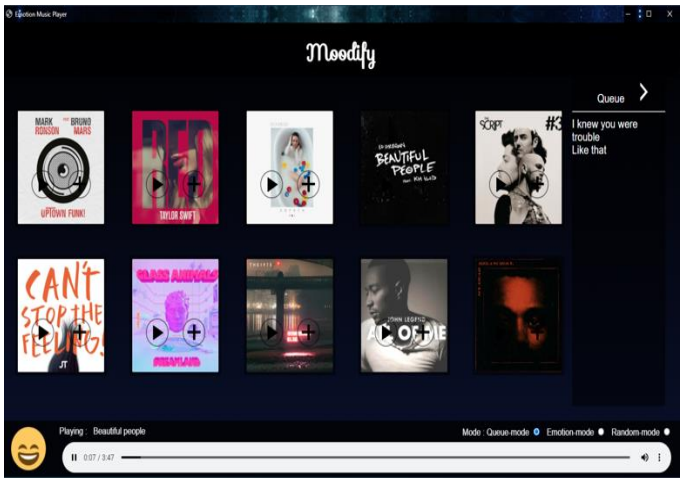


Figure 4: Case Happy
The emotion of the user has been detected as happy

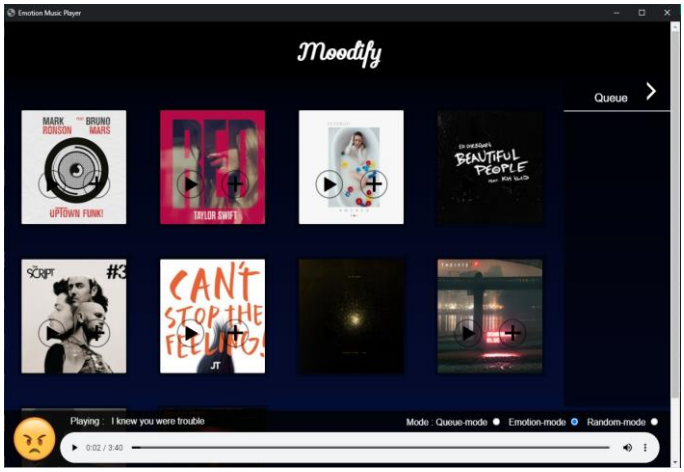


Figure 5: Case Angry
The emotion of the user has been detected as angry

The operation of Emotion Recognition is depicted in Figure 2, Figure 3, Figure 4 and Figure 5. The user's face is taken as input by the system and after recognizing the user's mood the output song is played based on the user's mood. Over here the Fischer-Face algorithm helps us to detect the expressions of the user along with the Haar-Cascade algorithm that is used for Object-detection.

6. ADVANTAGES

1. The application will play the song based on Users live mood instead of selecting the song from the playlist manually. hence it saves time.

2. The application we are developing has a simple User-Interface.

3. It is faster compared to traditional music player.

7. LIMITATIONS

1. Older generation people who are not much familiar with basic applications may not be much comfortable with an application like this.
2. Mood recognizer recognizes the mood and plays songs automatically.

8. CONCLUSION

For all the 4 emotions, the created program can perform emotion detection, recognition, object identification, and will play the song that best suits the users mood with high accuracy. This application may be improved to handle the issue of selecting songs manually from a playlist and will save lot of energy and time of the user.

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