

Mood based Music Player

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Abstract - The face of the human is an important organ of an individual's body and it plays an important role in extraction of an individual's behaviour and emotional state. Manually segregating the list of songs associated, generating acceptable playlist supported an individual's emotions could be a terribly tedious, time overwhelming, intensive and upheld task. Extracting the desired input from the human face can now be done directly employing a camera. This input will then be employed in many ways. One in every of the applications of this input are often for extracting the data to deduce the mood of a varied algorithms are developed and planned for automating the playlist generation method. Mood music Player aims at scanning and deciphering the information and consequently making a playlist based on the parameters provided.

Key Words: Music player, Face Detection, Facial Expression Recognition, Audio Feature Recognition, Viola Jones Algorithm.

1. INTRODUCTION

Music plays a very important role in enhancing an individual's life as it is an important medium of entertainment for music lovers and listeners and sometimes even imparts a therapeutic approach. In today's world, with ever increasing advancements within the field of multimedia system and technology, varied music players are developed with options like quick forward, reverse, variable playback speed (seek & time compression), local playback, streaming playback with multicast streams. though these options satisfy the user's basic needs, nevertheless the user has got to face the task of manually browsing through the list of songs and choose songs supported his current mood and behavior.

Facial Expression based music player is interactive, sophisticated and innovative mobile (Android) based application to be used as a music player in an exceedingly totally different manner. The application works in an exceedingly totally different manner from the normal because it scans and classifies the audio files present on the device and in line with the predefined parameters (Audio Features) present on the application so as to provide a group of mood based on the playlists. The real time input provided to the application is assessed (Facial expression recognition) to provide a "mood" which is able to then be accustomed choose the desired playlist accordingly.

2. LITERATURE SURVEY

The most easiest way to express emotions for humans is using facial expressions. We humans, often use nonverbal cues such as hand gestures, facial expressions, and tone of the voice to express feelings. The proposed approaches have focused only on the some of the basic emotions. For this reason, facial features have been categorized into two major categories such as Appearance-based feature extraction and Geometric based feature extraction by zheng et. al [1]. The paper by Hafeez Kabini et al [2] suggested the problem of the existing methods to handle only deliberately displayed and exaggerated expressions of prototypical emotions despite the fact that deliberate behavior differs in visual appearance, audio profile, and timing from spontaneously occurring behavior, by taking efforts to develop algorithms that can process naturally occurring human affective behavior have recently emerged. They also introduced and researched these recent information and discussed human emotion perception from a psychological perspective. Nikhil Zaware et al [3] stated that it is very time consuming and lengthy task to create and manage large playlists and to select songs from such playlists. Therefore, it would be of great use if the music player itself selects a song according to the current mood of the user using an application to minimize the efforts of managing playlists. In their paper, they stated a way to detect the mood of the user automatically and generate playlist of songs which is suitable for the user's current mood. The photo is captured using webcam and that photo is passed under various steps to detect the mood or emotion of the user.

The application is thus developed in such a way that it can manage content accessed by user, analyze the image properties and also determine the mood of the user. To detect facial expression as indicator to cast a music playlist is one task carried out by Setiawardhana et al [4] in their technical paper. They work by doing facial expression detection system input performed offline by taking images of a subject with nearest position from the camera where facial position must not be tilted. The image is identified as a combination of color and feature extraction is performed based on location of eyebrow, eye, and mouth.

Anukriti Dureha [5] suggested manual segregation of a playlist and annotation of songs, according to the current

emotional state of a user, as a labour intensive and time consuming job. A large number of algorithms have been proposed to automate this process. However the existing algorithms are slow and also increase the overall budget of the system by using additional hardware and have less accuracy.

3. PROPOSED SYSTEM

The proposed system tries to provide an interactive way for the user to carry out the task of creating a playlist. The working is based on different mechanisms carrying out their function in a pre-defined order to get the desired output. The working can be stated as follows:

1. The proposed System works by first providing a simple interface which prompts the user to analyse the memory for audio files when the application is opened.
2. After the files are detected, they are then scanned for audio features and these features are extracted.
3. The extracted feature values are then subjected to classification according to the parameters provided.
4. These parameters include a limited set of genre types based on the audio feature values to be processed.
5. After this, the songs are divided into different playlists based on the feature extraction process. Hence lists of similar songs or songs belonging to similar genres are generated.
6. In the next step, the camera is opened with required permission and a real time photograph (image) is captured which then provided to the system.
7. The system scans the photograph for presence of a face in the input using the face detection process, and then classifies the input and generates an output which is an emotion (mood) based on the expression extracted from the photograph.
8. After this, the expression then acts as an input and is used to select a matching playlist from the initially generated playlists and the songs from the playlists are played.

The block diagram for this system is given as follows:

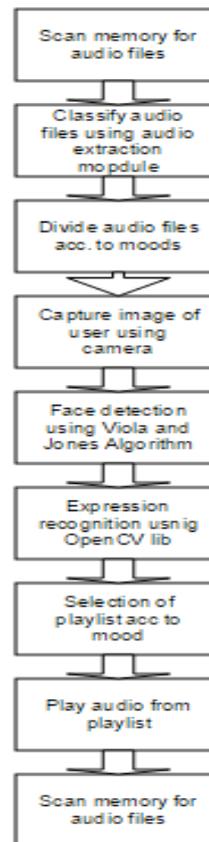


Fig -1: Proposed system

4. METHODOLOGIES

A. OpenCV

Open CV is a library of programming functions mainly aim at real time computer vision. It is a C++ implementation library. There is a JavaCV library which is derived from OpenCV using this we will implement viola and Jones face detection algorithm. Face detection is important as it will classify only if face is present. Expression recognition is also done using graphical based classification method. Audio files will be scanned and features will be extracted from them and according to the mood we get the playlist.

B. Android Studio

Android Studio is the official IDE for Android application development, based on IntelliJ IDEA.

C. Viola-Jones Algorithm

The Viola-Jones object detection framework is the first object detection framework to provide competitive object detection rates in real-time proposed in 2001 by Paul Viola and Michael Jones. Although it can be trained to

detect a variety of object classes, it was motivated primarily by the problem of face detection. This algorithm is implemented in OpenCV as `cvHaarDetectObjects()`.

D. Facial Expression Recognition

The output of Viola and Jones Face detection block forms an input to the facial feature extraction block. The required features are extracted using the JavaCv library that is imported in the Android Studio java folder. This helps in classifying that the input real time image has “x” as its expression i.e. the user’s expression.

E. Audio Feature Extraction

In this module a list of songs forms the input. This input is then matched with the output to get the desired playlists.

5. CONCLUSION

The Mood Based Music System will be of great advantage to users looking for music based on their mood and emotional behavior. It will help reduce the searching time for music thereby reducing the unnecessary computational time and thereby increasing the overall accuracy and efficiency of the system. Also with its additional features mentioned above, it will be a complete system for music lovers and listeners.

A wide variety of image processing techniques was developed to meet the facial expression recognition system requirements. Proposed system will be able to process the video of facial behavior, recognize displayed actions in terms of basic emotions and then play music based on these emotions. Major strengths of the system are full automation as well as user and environment independence. Even though the system cannot handle occlusions and significant head rotations, the head shifts are allowed. In the future work, we would like to focus on improving the recognition rate of our system.

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