EMO-MUSIC (Emotion based Music player)

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Abstract— Everyone wants to listen music of their individual taste, mostly based on their mood. Average person spends more time to listen music. Music has high impact on person brain activity. User always face the task to manually browse the music and to create a playlist based on the current mood. This project is very efficient which generate a music playlist based on the current mood of user. However the proposed existing algorithms in use are comparably slow, less accurate and sometimes even require use of additional hardware like EEG or sensors. Facial expression is a easy way and most ancient way of expressing emotion, feelings and ongoing mood of the person. This model based on real time extraction of facial expression and identify the mood. In this project we are using Haar cascade classifier to extract the facial features based on the extracted features from haar cascade, we are using cohn kanade dataset to identify the emotion of user. If the user's detected emotion is neutral then the background will be detected and the music will play according to the background. for example. If it detects gym equipment, the algorithm will automatically create a workout song playlist from the captured image of the background.

Keywords— Music, facial expression, Haar cascade classifier, viola jones algorithm, background detection

1. INTRODUCTION

Music is important in everyone's life. It play a important role in enhanching the person life .

Most music-loving users find themselves in an odd situation when they do not find songs to suit their mood in the situation. Ever since computers were developed, scientists and engineers thought of artificially intelligent systems that that are mentally and/or physically equivalent to humans. In today's world, with the development in technology and multimedia, there are many music players which have various features like fast forward, variable playback speed, local playback, streaming playback with multicast stream. Despite the fact that these features meet the basic needs of the user, the user still faces the task of manually selecting the songs through the playlist of songs based on their current mood and behavior. So we have came up with an idea of emotion based music player.
The main ambition of this paper is to design an proper and accurate algorithm that will generate a playlist based on the current mood of a user. The input image should not be blur or angled for the facial expression detection. For the facial expression detection we have used Haar Cascade classifier. After extracting a facial tone the next step is to identify the emotion. Here we are using Cohn kanade database to classify the emotion. Based on the detected emotion the playlist is generated automatically.

2. LITERATURE SURVEY

Currently there are different methodology proposed by researchers to classify the emotional state of human behaviour. We have only focused on some of the basic emotion of human.

A precise and efficient approach for examine the extracted facial expression was developed by Renuka R. Londhe et al. These document mainly focused on the study of changes in the facial curve and it also focus on the intensity of the corresponding pixels. The artificial neural networks (ANN) were used to classify the characteristics extracted in 6 main universal emotions such as anger, disgust, fear, happiness, sadness and surprise. A scaled conjugate gradient back propagation algorithm correlated with a two-layer neural network was used and achieved a detection rate of 92.2%. In order to reduce the human effort and time required to manually separate songs from a playlist, different approaches have been proposed in correlation with different classes of emotions and moods.

Thayer [16] proposed a very useful two-dimensional model (stress energy v / s), plotted on two axes and whose emotions are represented by a two-dimensional coordinate system based on two axes or on the four quadrants, which is represented by the two-dimensional diagram be formed. , The musical mood names and AV values of a total of 20 subjects were tested and analyzed in the work of Jung Hyun Kim [7]. Based on the results of the analysis, the aircraft AV was divided into 8 regions (clusters), which illustrate the mood using an efficient data mining algorithm for k-means clusters.

Galen Chuang et al. [2] made emotisphere, which is an intelligent sensor based device, which produce music depend upon client's present anxious state. This device translate physiological marker for emotion which are detected by a sensor called galvanic skin sensor and an impulse sensor, into composition of sound and light.This instrument works when user puts their hands on the ball to start recording and can hear the result immediately.

W. Amelia et al. [3] created a hybrid method that uses a combination of a keyword recognition technique and a learning method. Emotion recognition is based on Paul Ekman's basic emotions, which are anger, disgust, fear, happiness, sadness and surprise. The learning-based method used three algorithms: the multinomial logistic regression, the support vector machine (SVM)

and the multinomial naive Bayes. Here the entry is a short story and the system determines the type of emotion that would be induced in the reader. This technique uses several learning methods to deduce emotions, which makes the model expensive to calculate.

A. Metallinou et al. [4] investigated how emotional information is conveyed through facial and voice modalities and how these modalities can be used effectively to improve the accuracy of emotion recognition. Markers are placed on different areas of the actors' faces, and the data for each marker is summed, and the net value is the GMM for the face. Based on the GMM, the respective emotion is retrieved from the database. This technique requires that these markers be used whenever the emotion needs to be extrapolated.

Chien Hung Chen et al. [7] classify the songs by dividing each song into voice clips, which are then divided into 2 parts to know names and to abstain. The functions are calculated for the name and abstentions. The problem with this technique is that features are computed twice for the same song because all features are used by both the principal and the chorus.

Jung Hyun Kim et al. [1] Creation of a musical ambience model based on probabilities and implementation of a music recommendation system using the ambience model. Their pattern could express the complex mood of a song and generate a list of similar songs for multiple entries, mood tags, a song, and a value for valence excitation. Problems with their style that make it difficult to classify and express a song in a mood day or region of the Valencia excitement plan, different people feel different after listening to the same song and they haven't thought about the mood model adapt to the music and track the mood model of mood changes of users.

Many approaches have been developed to extract the facial and audio properties of an audio signal. There are very few systems available that have the ability to create an emotion-based songs playlist using human emotions. The few existing system designed which can create an playlist automatically. But they used an additional devices. The devices such as sensors or EEG systems. Using such devices additionally increases the overall cost of the proposed design. Some of the disadvantages of the existing system are as follows. Existing systems are very complex, it is complex in terms of time to extract facial features in real time. Existing systems can create a playlist but with less accuracy.

3. SYSTEM ANALYSIS

3.1 Existing System

The features available in the existing Music player present in computer system are as follows: I .Manual selection of songs
II. Party shuffle III. Music squares where user has to classify the songs manually according to particular emotion for only four basic emotion. Those are Passionate, clam joyful and excitement.

Using traditional music player, a user had to manually browse through his playlist and select songs that would soothe his mood and emotional experience. In today's

world, with ever increasing advancement in the field of multimedia and technology, various music player have been developed with features like fast forward ,reverse , variable playback ,local playback ,streaming playback with multicast streams and including volume modulation , genre classification etc.

Although these features satisfy the user's basic requirement, yet the user has to face the task of manually browsing through the playlist of songs and select songs based on his current mood and behavior. That is the requirement of an individual, a user sporadically suffered through the need and desire of browsing through his playlist, according to his mood and emotion.

3.2 PROPOSED SYSTEM

Here we propose a Emotion based music player Emo player. Emo player is an music player which plays song according to the emotion of the user. It aims to provide user preferred music with emotion awareness. Emo player is based on the idea of automating generation of music. The emotion are recognized using a machine learning method support vector machine algorithm. In machine learning, support vector machine are supervised learning models with associate learning algorithm that analyse data used for classification and regression analysis. It finds an optimal boundary between the possible outputs. The training dataset which we used is contain 400 faces and its desired values or parameters. The webcam capture the images of the user. It then extract the facial features of the user from the captured images. The training process involve initializing some random values for say smiling and not smiling of our model, prediction and then adjust the value so that they match the prediction that were made previously. Evaluation allows the testing of the model against data that has never been seen and used for training and is meant to be representative of how the model might perform when in the real world. According to the emotion, the music will be played from the predefined directories.

3.3 Advantages of proposed system

I. User don't want to select songs manually.
II. No need of playlist.
III. User don't want to classify the songs based on the emotion.

4.SYSTEM DESIN

The images of user is captured through webcam. then it select your face throughout the body using Viola-Jones algorithm. After selecting face program crop the face part and store in a memory. After that we extract facial feature like nose, ears, eyes, lips, etc. We trained the SVM so that it can classify the emotion. We create a database of different emotion and each emotion contain different songs related to their category. At the end when the input image facial expression will match with any category of emotion, then our API will play that catagory song.

Haar Cascade Classifier

Haar cascade classifier is an effective object detection method proposed by Paul Viola and Michael jones in their paper. It is a machine learning based approach where a cascade function is trained from a lot of positive and negative images. It is then used to detect object in other images.
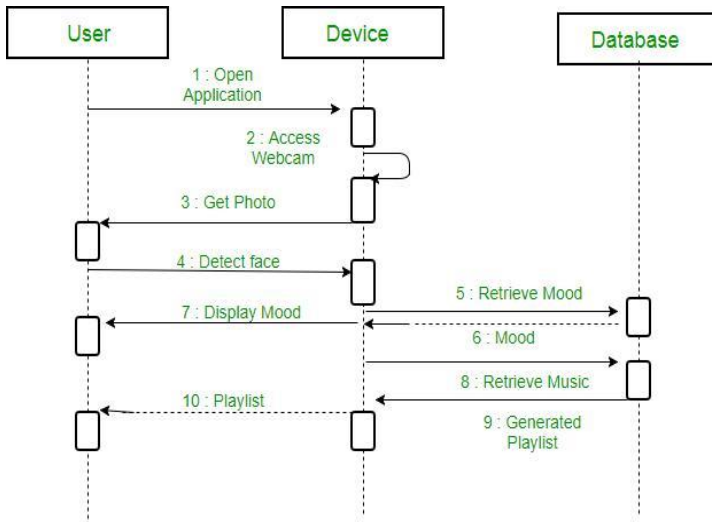

FIG 2. EDGE, LINE AND FOUR-RECTANGULAR FETURES

FIG 4.FACIAL EXTRACTION BY EDGEFEATURE

FIG 1. SEQUENCE DIAGRAM OF THE PROPOSED SYSTEM

In the following we have described each block used in our algorithm in detail. Image processing and computer graphics use tone mapping. This is a technique for matching a range of colors to the presence of an image with a high dynamic range in another medium with a finite dynamic range. The details and appearance of the colors complement the original visual content.

The Viola Jones Object Recognition Framework is the first recognition framework to offer competitive real-time object recognition rates. The Viola Jones Object Recognition Framework proposed by Paul Viola and Michael Jones in 2001.The Viola Jones calculation is a generally utilized component for object discovery. One of the main features of the Alt-Jones algorithm is that training is slow, but detection is fast. This algorithm does not use multiplications, but basic hair function filters.

Each face detection filter (from the set of N filters) contains a set of cascaded classifiers. Each classifier looks at a rectangular subset of the detection window and determines whether it looks like a face. The following classifier is used when it looks like a face. The face is recognized when all classifiers give a positive answer and the filter gives a positive answer.
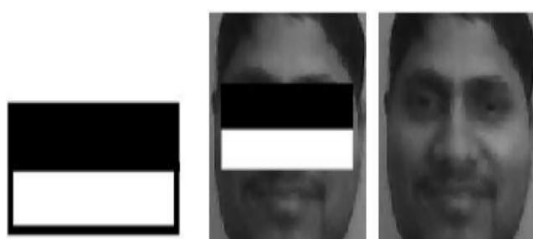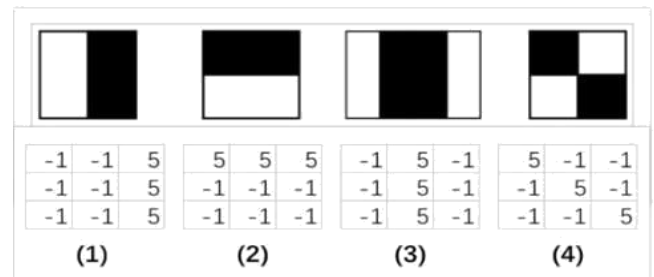
5. CONCLUSION

The system is thus intended to provide a cheaper, additional hardware-free and accurate emotion-based music system to Windows operating system users. Emotion-based music systems will be of great advantage to the users looking for music based on their mood and emotional behavior. The system will help to reduce the time to search the music according to the mood of the user. By reducing the unnecessary time to compute, this increase the overall accuracy and efficiency of the system.In this proposed `framework system will automatically delete or blacklist the song which user skip frequently.

6. FUTURE SCOPE

The proposed system might have many function and it may be user friendly but the proposed system can have further advancement in future.The future scope in this system will be to create a mechanism that will be helpful in music therapy treatment and will provide the music therapist needed to treat patients suffering from disorders such as mental stress, anxiety, acute depression, and trauma.The proposed system is currently available on windows operating system, In future it will be available for the user using different operating system such as ios,ubuntu,etc. and mobile phone platform as well.

The proposed system tries to avoid unforeseen results generated in the future in extremely poor lighting conditions and very poor camera resolution.In the proposed work only one emotion is detected at a time so that it can be further enhanced to detect mixed emotion

FIG 4.FACIAL EXTRACTION BY LINE FEATURE

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