Expression Player

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Abstract- ***Human face indicates the behavioral and emotional state of the individual. We can extract the information from human face to categorize it into different forms of emotions. Extracting required input from human face can directly done by Camera .To understand the emotion music always been a popular choice. Music has some medical qualities that it can be used as stress reliever, it can be a mood changer, kills loneliness. FER method is used to recognize the mood. This system reduce the creepy work of manually segregating or grouping songs to different lists and helps in generating an appropriate playlist based on an individual's emotional features. Facial expression based music system is used to scan and interpret the data and according to that it creates playlist based on input's provided. Facial expression detection system should address three major problems: Detection of face from an image, Facial feature extraction and Facial expression classification.***

Indexed Terms- ***Emotion recognition, Computer vision, Camera, Music, Facial Expression Recognition (FER).***

I. INTRODUCTION

Music widely known as "language of emotions", even new born babies also quickly reacts on music. Everyone has their taste and liking towards music. Evidence on human brain reacts to music differently is not yet available. Scientists have discovered some reasons which state that after hearing a short piece of music participants were more likely to interpret a neutral expression as happy or sad to match the tone of the music they heard.

Facial expression give important rules about emotion in areas of security, entertainment and human machine interface, emotion can use in these areas. Generally we show our emotion through our lips, eyes, place of eyebrows. To avoid some kind of trouble of selecting songs which may not appropriate for the current mood of the user and it may lead to disappointment.

In this project face detection is made by creating of face chips on the dimensions of human face by creating and joining multiple feature point of chin, cheeks , lips , forehead etc. Algorithm is created and inserted into the system which classifies the emotion into their respective order based on various machine learning techniques.

To provide user best possible and effortless pleasure of music FER based system have been adopted as they provide more fast, accurate and efficient results with less efforts. Our aim is to provide users a platform through which on their current mood music is played.

- Facial Expression Recognition (FER) System

Facial Expression Recognition uses the concept of Dimensionality Reduction where higher-dimensional features are converted into lower-dimensional ones. It firstly detects the face from the input image provided by the user following which facial features like Eye pair, Nose and Mouth are extracted which are helpful in classifying the facial expression of the individual as Happy, Sad, Neutral, Angry[2].

II. LITERATURE SURVEY

Various methodologies and techniques have been proposed to classify the behavioral and emotional state of the user. The techniques such as Neural Networks (NN), Support Vector Machines (SVM), and Local Binary Patterns (LBP) have also been used. The proposed approaches have focused only on the some of the basic emotions. Facial features, for the purpose of feature recognition, have been classified by zheng . Under two broad categories viz. Appearance-based features and Geometric features. The geometric features were derived from shape or prominent points of some important facial features such as mouth and eyes. 58 landmark points were considered to craft an

ASM. The appearance based features, such as texture, have also been employed in different works.

SR.NO	PAPER NAME	AUTHORS	YEAR	MERITS	DEMERITS	INFERENCE
1.	A Music Player Based on Facial Expression Recognition	Anukriti Dureha,AnaghaS.DhavilkarMegheshwari Sanjay Lad,	Apr-2018	It will help reduce the searching time for music there by reducing the unnecessary computational time and thereby increasing the overall accuracy and efficiency of the system.	Existing systems lack accuracy in generating a playlist based on the current emotional experience of a user.	The system works using the principle of FER to play song based on recognized mood of the individual. It makes use of Viola-Jones (VJ) algorithm alongside PCA approach to extract essential facial features.
2.	An accurate Algorithm for Genrating a music playlist.	Alvin I. Goldmana, b.Chandra and SekharSripadab, Byeong-jun Han, Seungmin Rho, Roger B. Dannenberg	Aug-2014	Extreamly fast feature computation AND Efficient feature selection	systems etems and sensors that increased the ovemployed additional hardware like Fer sysrall cost of the system	The system eradicates the need of browsing through the Web or any other Mobile Application for desired song and ensures correct song is played for current mood of User.
3.	International Journal of Pure and Applied Mathematics	Anvita Bajpai and Kunal Chadha, Elena Alinonte and Corneliu Lazer, Sushmita G. Kamble.	2014	Accuracy is more using Face SDK. Scale and location invariant detector, instead of scaling the image itself.	Takes more space than it should. Detector is most effective only on frontal image of faces.	Face detection along with Facial feature extraction– receiving the cropped essential facial components like Eyes, Lips and Eyebrow.
4.	International Journal of Innovative	S L Happy, Anjith George and Aurobinda Routray,	2011	Ease of use, No trouble of troublesome	Mixed mood detection is not provided by the	Artificial Intelligence(AI) and Machine

	Research in Computer and Communication Engineering			selection of songs, Can be used in vehicles	application. It is able to judge only one mood at a time.	Learning(ML), our aim is to provide the users a platform through which on their current mood, music is played using Facial Expression Recognition.

III. PROPOSED SYSTEM

Music plays an important role in an individual's life. It is an important source of entertainment. Here we propose an Emotion based music player. It plays song according to the emotion of the user. For that system ask for the input image which is captured through webcam. Then that image undergoes pre-processing i.e. removal of noise, blurriness and resizing of the images. Then the required features are extracted from the image and stored as useful information. These features are later added to the classifier where the expression is recognized with the help of Euclidean distance.

Minimum the value of the distance calculated, the nearest the match will be found. After classifying the user emotion, the system will use that emotion to match and recommend songs which have the relevant mood. Then, it will generate an emotion based playlist and pick up the songs from a database. Currently, there are 250 songs in the database. They are grouped into different emotion types. The songs are suggested based on a user's mood. Finally, a music track will be played based on the emotion detected of the user.

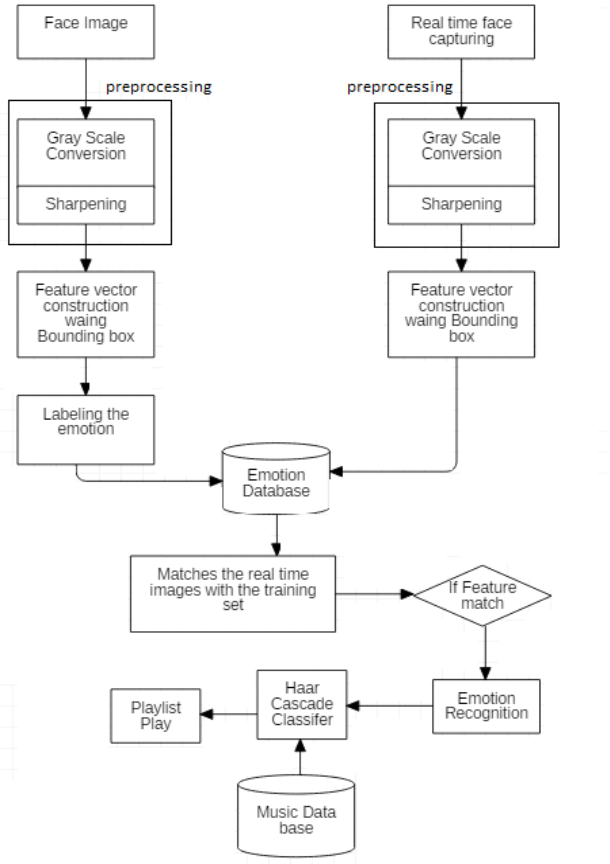
The images of user is captured through webcam. After capturing the image it is stored in a memory. After that we extract facial feature like nose, ears, eyes, lips, etc. We trained the SVM so that it can classify the emotion. We create a database of different emotion and each emotion contain different songs related to their category. At the end when the input image facial expression will match with any category of emotion, then system will play song from that category.

IV. IMAGE PROCESSING

Pre-processing is mainly done to eliminate the unwanted information from the image acquired and fix some values for it, so that the value remains same throughout. In the pre-processing phase, the images are converted from RGB to Grayscale. The images considered are in .jpg format, any other formats will not be considered for further processing. During pre-processing, eyes, nose and mouth are considered to be the region of interest.

A. Input Image: According to architecture diagram capturing image is the first task to be performed. We are going to capture image of user by using webcam. There are certain conditions while capturing image such as user should be near to camera.
B. Training Image: Training image is provided by image database.
   Input Image: The input image will be the image captured by webcam.
   Pre-processing: This involves the processing of the image by changing the contrast to view it more accurately
C. Face Detection: This feature is for identifying the areas in the facial expression to express the emotion
   Feature Extraction: This feature will extract the feature of the facial expression.
D. Data Set: Dataset is pool of predefined images used for identifying the facial expression.

Classifiers: this feature is used for matching the captured with the pre-defined to get accurate emotion.
System design



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VI. ALGORITHM

1. Capture image using Webcam and save (input image).
2. Face detection.
3. Extract facial expression using FER
4. Device will recognize the emotion and will play music
5. According to emotions songs list will be open.

- Advantages:

1. Easy to use
2. No trouble in selecting songs.

- Disadvantages:

1. Mixed mood detection is not provided by the application. It is able to judge only one mood at a time.

VII. RESULT

The system goes through various stages in order to get the required result. Currently, this system supports four applications. It has four categories are-

1. Happy
2. Sad
3. Neutral
4. Anger

These four categories of emotions defined playlist for each other.

Fig. 1.1

Based on the facial expressions captured using the web camera and then emotions of the user detected a shown as fig. 1.2

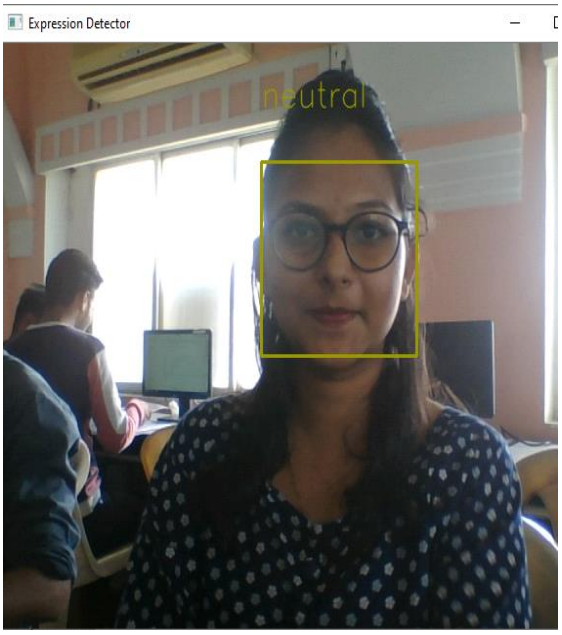

Fig.1.2

This system recognizes the user's emotions as 'Neutral' shown in fig.1.2.

Based on the facial expression captured the play-list is generated with the emotion and It's displayed to the user. As shown in fig.1.3

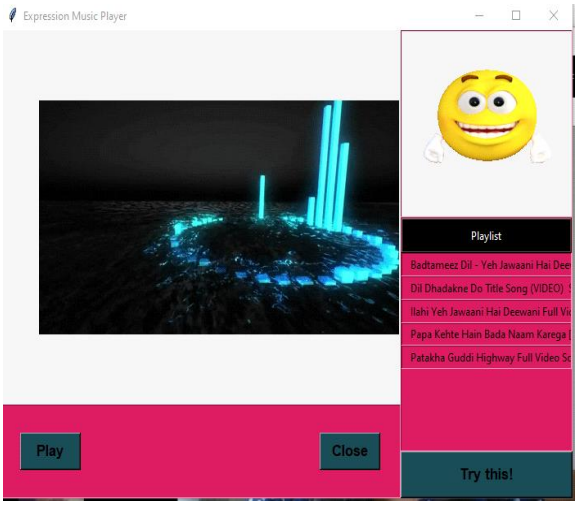

Fig.1.3

The system displays 'Neutral playlist' as shown in fig.1.3

CONCLUSION

We have designed Moody Player a mood based music player which uses a face detector which is based on a facial landmark detection system. The system used to give a better music player experience for the user. It eases the work of the user by capturing the images using a web camera, determining their facial expressions and suggesting a play list through a more advanced and interactive system. The system works using the principle of FER to play song based on recognized mood of the individual. The system provide better enjoyment and environment to the user by providing the most suitable song to the user according to his/her current emotion. This system is applicable in various fields like Medical Science and Psychology as it will be helpful in Music Therapy treatment for music therapists to treat their patients suffering from depression and mental stress. In future Moody Player can be enhanced with the capability of detecting the mood of a group rather than individuals. And can be than effectively use in public places and gatherings. The future scope for this system would be to implement it on Mobile platforms like Android as there has been increase in the number of Mobile phone application users worldwide. The system eradicates the need of browsing through the web or any mobile application for desired song and ensures correct song is played for current mood of user.

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