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EMOTION BASED MUSIC RECOMMENDATION SYSTEM

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ABSTRACT

It helps in extracting and understanding the emotion that an individual has based on various features of the face such as eyes, cheeks, forehead or even through the curve of the smile .Our project deals with detecting emotion of an individual through facial expression and playing music according to the mood and it may calm the individual and also can get quicker song according to the mood, it helps the user to reduce the stress levels . The user could not have to waste any time for searching or to look up for songs and automatically, the best track matching with users mood is detected by using the image of the user which is captured with the help of a webcam.

1. INTRODUCTION

1.1 FACE RECOGNITION WITH WEB CAM

Project EMO player (an emotion based music player) is a novel approach that helps the user to automatically play songs based on the emotions of the user. It recognizes the facial emotions of the user and plays the songs according to their emotion.Face expression recognition is used to recognize the essential human emotions. The facial expressions convey essential emotional facts and details. In the next generation of computer vision systems, programs and systems focused on the interaction of images may play an important role. Face emotion can be used in the areas of human machine interface (HMI) defense, entertainment and. A human being can convey his / her emotions through his / her mouth, eyes, etc. People usually have a great number of songs in their collection or playlists. Using traditional music players, 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 advancements in the field of multimedia and technology, various music players have been developed with features like fast forward, reverse, variable playback speed (seek & time compression),local playback, streaming playback with multicast streams and including volume modulation, genre classification etc. Although these features satisfy the user‘s basic requirements, the user has to face the task of manually browsing through the playlist of songs and selecting songs based on his current mood and behaviour. So to avoid difficulty choosing a song, most people only pick a song from their playlist at random and some of the songs might disappoint the user. As a result, some of the songs are not matching the user’s current emotion. In addition, there's no widely used program

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that can play songs based on the user's current emotions.

That is the requirements of an individual, a user sporadically suffers through the need and desire of browsing through his playlist, according to his mood and emotions. Music plays a crucial role in enhancing or improving an individual's life as it is an important medium of entertainment and relaxation for music listeners and has even proved to have a therapeutic weightage Although these features satisfy the user's basic requirements, the user has to face the task of manually browsing through the playlist of songs and selecting songs based on his current mood and behaviour. So to avoid difficulty choosing a song, most people only pick a song from 1 their playlist at random and some of the songs might disappoint the user. As a result, some of the songs are not matching the user's current emotion. In addition, there's no widely used program that can play songs based on the user's current emotions.

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1.1.1APPLICATIONS

Currently in existing application , music is organized using playlist and different types of moods . When user will click to their current type of mood it might happen that they don ' t like the play – list created by the developer because here developer is also playing the role of user so it's hard to define that's what kind of play -list user would like . Everyone have their own choice 2 about them , contrast colour. This also become necessity to give choices about them dark, light , colourful . As a music lover I thought to give a effort less music player like speech to play music and more impressive function.

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A music player should be build in such a manner which satisfies user with perfect sound quality and many more option of improving bass . Many people like high bass, live, Custom, Rock Jazz, Electronic and many more types of effects in sound mode so it is challenging parts to provide all in equalizer

1.2 PROBLEM DISCUSSION

Using traditional music players a user had to manually browse through his playlist and select songs that would soothe his mood and emotional . In today's world, and technology, various music players have been developed with features like fast forward , reverse , variable playback, streaming play back with multicast streams and including volume modulation, genre classification etc. Although these features satisfy the user's has to face the task of manually browsing through the play-list of songs and select songs based on his current mood and behavior. For accessing this application user has to first login or sign-up. User can see various types of moods in Mood tab after login. Such as Chill, Romance, Energy Booster, many more. And when a user clicks on mood as per there choice list of songs would be displayed and user can enjoy their time by listing music. User can download as well as share there play-list. User can do search with music as well as artist also. Face detection and facial feature extraction from images is the first step in emotion based music player. For the face detection to work effectively, we need to provide an input image which should not be blurred and tilted. Once proper facial images are retrieved, linking them with music recommendations will be done.

Fig-1.: Different emotions of a person

1.3 HAAR CASCADE FACE IDENTIFICATION:

This classifier is based on the Haar Wavelet method to analyse pixels in an image into squares by a predefined function. It uses the "integral image" concept to calculate the features detected. The Haar Cascade algorithm uses the Ada-boost learning algorithm. Haar features are identical to those convolutions that are used to detect the feature's presence in a given picture. It is a machine-based learning technique, in which a cascade function is trained from both positive and negative images. It is then used on other images to detect artifacts. The algorithm originally requires a lot of positive pictures (face pictures) and negative images to train the classifier. Then we need to extract from the functionality. Hair features displayed in the picture below are used for this. They are just like our kernel that is coevolutionary. -- function is a single value obtained by subtracting the pixel total from the number of pixels under the black rectangle below the white rectangle.

2. LITERATURE SURVEY

2.1 PYTHON PROGRAMMING

The working revolves around detecting emotion and playing the song accordingly, as we move further and dig deeper with each step we analyse various aspects that needs to be taken care of like the dataset that can be used for detecting emotion and when the

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emotion is detected what kind of music should play whether to alleviate the mood or keep it as it is. Finding the right song for one's current mood is troublesome, especially, when a person mood andhas to search through the entire playlist to find that one song that calms him down. Also, generating a playlist is no piece of cake. It requires time, patience and a lot of effort. The subsequent table shows that data consists of 48x48 pixel grayscale images of faces. The faces are automatically registered to the face that is more or less centred and occupies about an equivalent amount of space in each image. The task is to categorize each face supporting the emotion shown within the countenance into at least one of seven categories (0=Angry, 1=Disgust, 2=Fear, 3=Happy, 4=Sad, 5=Surprise, 6=Neutral). Machine learning is the main technology used in this project. Machine learning is a field of computer science that uses statistical techniques to give computer systems the ability to "learn" (i.e., progressively improve performance on a specific task) with data, without being explicitly programmed.

2.2STEPS IN MACHINE LEARNING:

1.Gathering data.
2. Preparing that data.
3. Choosing a model.
4. Training.
5. Evaluation.
6. Hyper parameter tuning.
7. Prediction.

5 2.3 Dataset used is fer2013.csv

Python library such as openCV is used for processing the image and other functions that user will provide in order to detect the emotion, keras is used for estimating and developing deep learning models, tensorflow is used for defining and training neural network models, numpy has been used to store the array of images. Altogether these libraries are blended together and further when the user makes a different facial expression in front of the camera the emotion is detected along with the probabilities of a particular emotion and further plays a song according to the mood detected which would alleviate the mood. Music directories are used to play music in our product after detection of emotion. A main directory named “Songs ” that contains a subdirectory for every emotion. Each sub-directory contains songs that correspond to the emotion. Songs in the sub folders can be changed/replaced or deleted by the programmer depending on the requirements of the user.

●We have studied a machine learning course from “Udemy”.

3. SYSTEM DESIGN

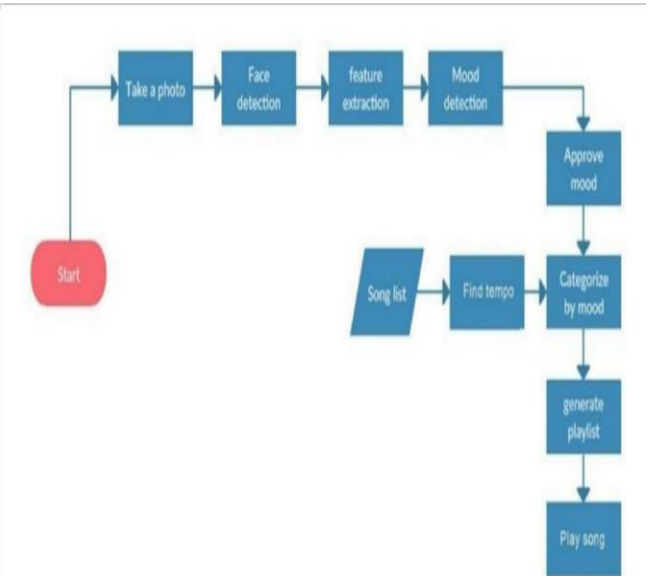

Fig:2: Workflow Diagram

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ACTIVITY DIAGRAM

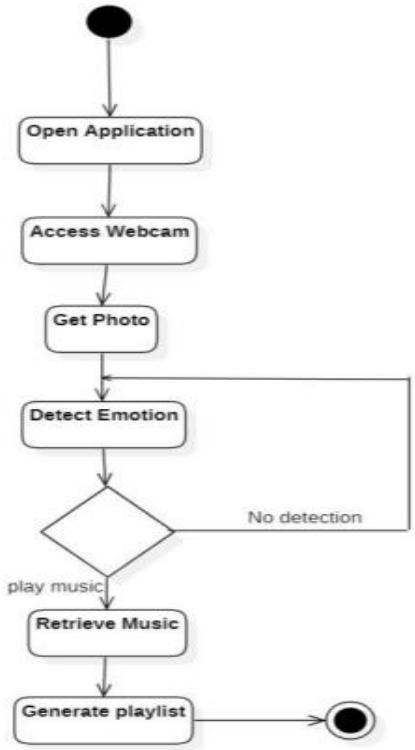
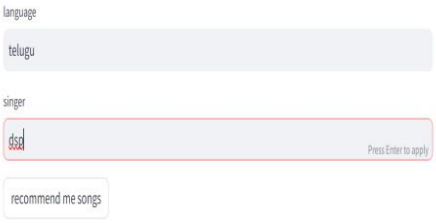


Fig:3: Activity Diagram

Fig:4: Detection of Emotion

4. OUTPUT SCREEN



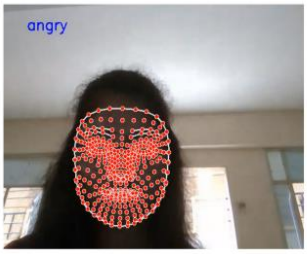


Fig:5: Different Types Of Emotions

PART-1:

The training model we used for identifying the emotions was able to classify

Angry
Disgust
Fear
Happy
Sad
Surprise
Neutral

The training accuracy was found to be 97% i.e 0.9764(fig:1.1). The loss and metrics on the test data is shown in fig

Fig 6: Accuracy of model

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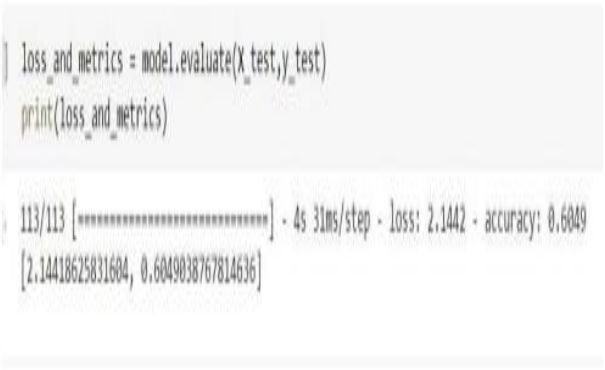

Fig:7: The loss and metrics on the test data

5. CONCLUSION

The Emotion-Based Music Player is used to avoid manual work and give a better music player experience for the end user. The product solves the basic needs of music enthusiasts without troubling them as existing applications do: it uses technology to increase the interaction of the system with the user in many ways. It eases the work of the end-user by capturing the image using a camera, determining their emotion, and suggesting a customized play-list through a more advanced and interactive system. The application developed will reduce the efforts of the user in creating and managing playlists.

6. FUTURE ENHANCEMENT

Image capturing can be made more efficient in low light environments. More accurate playlists can be generated. Even more compact devices can be designed. It is additionally seen that to improve the exactness of the arrangement framework the informational collection used to construct the grouping model could be expanded further.

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