International Journal of Research in Engineering and Science (IJRES)
ISSN (Online): 2320-9364, ISSN (Print): 2320-9356
www.ijres.org Volume 10 Issue 5 ǁ 2022 ǁ PP. 01-04

Mp3 Music Player based on Mood Detection

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Abstract— *Conventional method of playing music depending upon the mood of a person requires human interaction. Migrating to computer vision technology will enable the automation of such systems. To achieve this goal, an algorithm is used to classify the human expressions and play a music track according to the present emotion detected. It reduces the effort and time required in manually searching a song from the list based on the present state of mind of a person. The expressions of a person are detected by extracting the facial features using a cv2 cascade classifier.*
Keywords—*Python, Machine Learning, Mood Detection*

Date of Submission: 12-05-2022 Date of acceptance: 26-05-2022

I. INTRODUCTION

Music is an essential component of our daily life. We listen to songs as per our mood. Music is one of the media of entertainment and even imparts a therapeutic approach. It is important to play an appropriate song on the particular emotional state. The existing music player satisfies the user's basic requirements, 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.

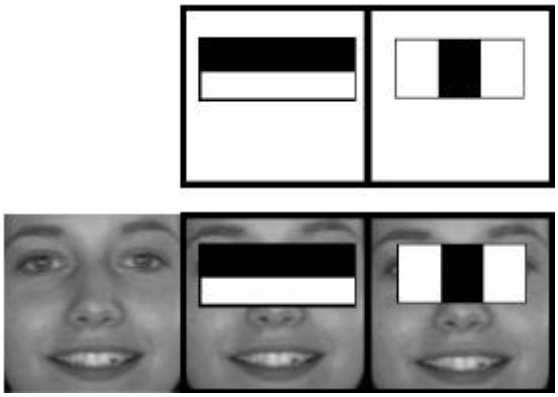
This project aims to develop an intelligent system that can easily recognize facial expressions and accordingly play a music track based on that particular expression and emotion recognized. The theme is based on the principle of detection of human emotions to play appropriate songs for the current emotional state. The current emotional state of a human being can be easily observed through their facial expressions. It can be achieved with help of image processing and machine learning techniques. The Emotion-Based Music Player provides a better platform to all the music listeners and ensures automation of song selection and periodic updating of playlists. This helps users organize and play songs based on their moods. The player should also give recommendations for users to change songs on the go.

II. FACIAL DETECTION USING HAAR CASCADE

Object Detection using Haar feature-based cascade classifiers is an effective object detection method. It is a machine learning-based approach. In this approach, a cascade function is trained from a lot of positive and negative images. It is then used to detect objects in other images. First of all, a lot of positive images (images of faces) and negative images (images without faces) are used to train the classifier. Then features are extracted from it. For this, haar features shown below the image are used. They are just like our convolutional kernel. Each feature is a single value obtained by subtracting the sum of pixels under the white rectangle from the sum of pixels under the black rectangle.

A. **Graphics:** Besides having a progressing storyline, the visual appeal also plays a relevant part in your game's success. This can also be a defining factor on whether people will buy the game or not. No one wants to play a game full of graphic glitches and art unappealing to the eyes. Through the years, game designs have evolved, but some games have outdone themselves; some games are very well detailed and that could be mistaken for being real rather than a game.

B. **Socially competitive features:** Most games today offer you the ability to play with and against your friends and other players around the world. Being able to play with friends in real-time increases engagement depth and prolongs the time you play the game and increases player immersion. You can add additional multiplayer game modes to your game to play with different strategies with or against your teammates.

C. 

III. EXISTING MODEL

- Mood Player: This app uses face detection and mood recognition to work out the user's mood and supported this; it gives a personalized playlist. The face detection rule is predicated on the OpenCV library and also the mood detection half is going to be based on pattern matching. If we all know the knowledge that is required, we tend to use the last. Fm information that joins each song with tags that describe it. These implementations square measure designed to get a list per the user mood's and provide these functionalities: Set your mood manually: happy/sad 2. Get your mood mechanically by analyzing a periodical camera capture (frequency may be set from the menu) 3. Set the music tempo, from calm to energetic.
- Stereo mood may be a mobile or pill application. With the press of a button, we'll have a readymade playlist for each time in our life: we will opt for our mood from our tags, listen, discover new music, share and tag our emotions in music. This application offers the subsequent functionalities: 1. Hear over a hundred mood playlists. 2. Share your mood and music with your friends on Facebook and Twitter. 3. Tag the songs by mood, serving to the United States to create the mood primarily based playlists. 4. Discover new artists through your mood. 5. Discover your emotional profile of the week by clicking on the "my mood" filter.

IV. PROPOSED MODEL

Several methods have been proposed earlier to detect and recognize the facial features and audio features from images and audio signals with certain algorithms. But there are very few systems that automatically generate a playlist based on the expressions detected, which make use of some additional hardware like sensors or EEG.

Electroencephalography (EEG), signals to record the electrical activity of the brain within its neurons. These signals are mainly used because it detects real emotions arising instantly from the mind ignoring all other outside characteristics like facial expressions or gestures.

Brain-Computer Interface (BCI) based mobile multimedia controller is proposed which uses an external EEG hardware to monitor the current state of mind & require the user's active mental command continuously to control the multimedia. Most BCI systems require huge and costly EEG machines and commercial software which limit the feasibility of the system for daily applications.

To counter this limitation, we are proposing a software-based solution that uses an inbuilt webcam to recognize facial expressions of the user and generate an appropriate outcome (Here: Plays appropriate music depending on the user's mood)

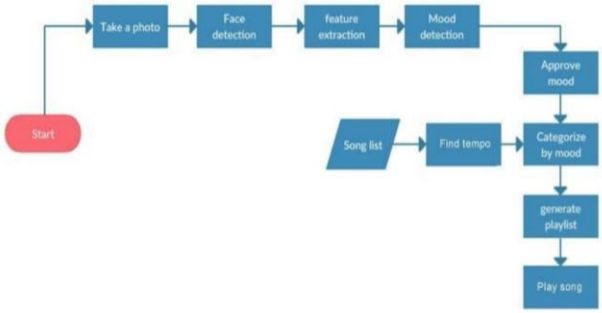
V. METHODOLOGY

The mood-based music system is computer-based software that focuses on implementing mood detection. It is a prototype of a new product that merges some separate interfaces: face detection, facial expression recognition, Playlist generation, play music.

● The Face detection System will take real- time input from a web camera. We have used OpenCV libraries to implement face detection through the Haar cascade classifier. Haar cascade classifier implemented in stages by application of features grouped into criteria such that it will discard the unwanted part from further analysis. Face detection algorithm detects face and further, it will extract required features from it.

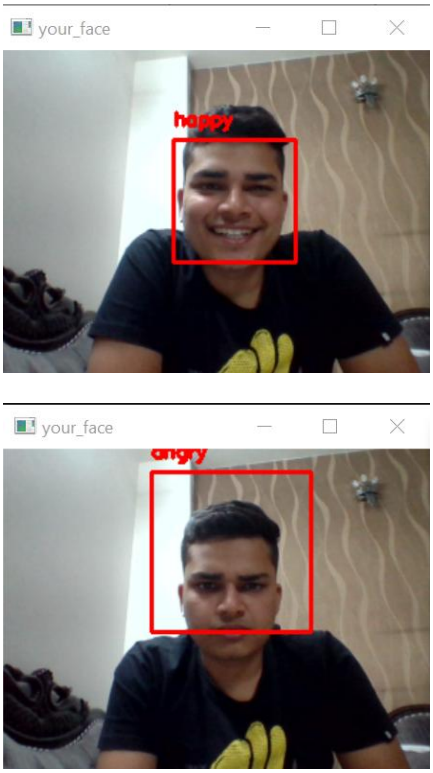
● **Mood detection**: Different muscles can
predict human emotional state. We have used CNN classifier to detect emotional states. CNN is made up of neurons with learnable weights and biases Each neuron receives several inputs and passes them through the convolution operation function to create an output layer. This function emulates the response of an individual

neuron to visual stimuli. Then takes a weighted sum over all inputs. Each convolutional neuron processes data only for its receptive field. So a fully connected neural network is made up of many input layers, that can be used to learn features and differentiate data. The model we have used is trained using the FER-2013 dataset. This dataset contains 35,887 grayscale images where each image belongs to one of the classes {"angry", "disgust", "fear", "happy", "sad", "surprise", "neutral"}.. This format is a grid format that is ideal for storing multi-dimensional arrays of numbers. By importing this model in Python, mood can be decided from the detected face. The Finalized mood is passed to the music player module to recommend the appropriate song.



VI. RESULTS

The Result of mood-based music system can be seen through accuracy in mood detection and songs recommendation. It is hard to find accurate human emotion only through only one parameter. But with facial expression, it can be detected up to some extent. The Result of mood detection through facial expression under proper lightning conditions can be seen in figure 3. The Model we have used has achieved 78% of accuracy. As it is computer-based system it understands emotions in the way we trained them. The System takes that mood and generates a music playlist for that mood accurately. System can play most of the songs from a recommended playlist.



VII. CONCLUSION

The system after model training correctly identified the facial expression with an accuracy of 78%. The model turns out to be cost-effective and requires no expensive hardware like EEG. Commercial software is not required which otherwise limits the feasibility of the system.

VIII. FUTURE SCOPE

The future scope for the proposed system would be to implement it on mobiles. To design a mechanism that would help in the music therapy treatment for the music therapists to treat the patients suffering from mental stress, acute depression, and trauma. It can also be used to determine the mood of a physically challenged person.

In the proposed work, only one emotion can be detected at a time so it can be extended to mixed mood detection by continuously recording the face of the user.

An algorithm to slowly change a negative mood to a happy mood could be built to enhance mental health.

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