Music Playlist based on Human Expression

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Abstract: *Facial expression is the visible manifestation of the affective state, cognitive activity, intention, personality and psychopathology of a person and plays a communicative role in interpersonal relations. Automatic recognition of facial expressions can be an important component of natural human-machine interfaces; it may also be used in behavioral science and in clinical practice. An automatic Facial Expression Recognition system needs to perform detection and location of faces in a cluttered scene, facial feature extraction, and facial expression classification. Facial expression recognition system is implemented using Convolution Neural Network (CNN). CNN model of the project is based on Net Architecture. Kaggle facial expression dataset with seven facial expression labels as happy, sad, surprise, fear, anger, disgust, and neutral is used in this project. The system achieved 56.77 % accuracy and 0.57 precision on testing dataset. Keywords: Facial Expression Recognition, Convolutional Neural Network, Deep Learning.*

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I. INTRODUCTION

Music is important in everyone's life. It play an important role in enhancing 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 behaviour. So we have came up with an idea of emotion based music player.The emotions are recognized using a machine learning method EMO algorithm. The human face is an important organ of an individual's body and it especially plays an important role in extraction of an individual's behaviours and emotional state. The webcam captures the image of the user. It then extracts the facial features of the user from the captured image. The foremost concept of this project is to automatically play songs based on the emotions of the user. It aims to provide user-preferred music with respect to the emotions detected. In existing system user has to manually select the songs, randomly played songs may not match to the mood of the user, user has to classify the songs into multiple emotions and then for playing the songs user has to manually select a particular emotion. According to the emotion, the music will be played from the predefined directories. Each sub-directory contains songs that corresponds to the emotion. Songs in the sub folders can be changed/replaced or deleted by the programmer depending on the requirements of user. At times it is possible that user might like different kinds of songs in certain mood. For example, when a user's emotion is detected to be Sad, then it is totally user's choice what kind of mood does he/she wants.

Therefore, depending on the choice of users the songs in the sub directories can be changed. As the program runs successfully on system, The image recognition system is classified into two types, featurebased system, and image-based system. In the initial system, options extracted from the image parts, nose, mouth, lips, etc. That are then sculpturesque to confirm the relation between these options. Whereas in the second system, image pixels are used and represented as inbound methods such as Principal Component Analysis, Wavelet transformation etc. That is then used for image classification and identification. In the model few sample models are included such as Happy, Sad, Angry, Disgust, Fear, Surprise and Neutral. It also has mixed mood feature. Every sample model is assigned with some songs according to the

classification of user. Emotion based music players available now in use are more time consuming than our proposed system.

II.LITERATURE REVIEW

According to AyushGuidel [1] et al, one may quickly determine a person's emotional condition by observing their facial expressions. Basic emotions (happy, sad, angry, excited, surprised, disgusted, fear, and neutral) were taken into account when developing this system. In this research, face detection was implemented using a convolutional neural network. On the whole, people refer to music as a "language of feelings."

Preema [2] et al. claim that creating and maintaining a large playlist requires a lot of time and work. The report claims that the "music player itself selects a song based on the user's current mood, and the application analyses and categorizes audio files according to audio properties to construct playlists depending on moods.

Sadhvika [4] et al. recommended manual playlist segregation and song annotation based on the user's current emotional state as a time-consuming and labor-intensive task. There have been many algorithms suggested to automate this process. However, the currently used algorithms are slow, use extra hardware (such EEG structures and sensors), raise the system's overall cost, and have substantially lower accuracy.

The report suggested by Ramya Ramanathan [3] described an intelligent music player that used emotion recognition. A fundamental aspect of human nature is emotion. They have the most significant role in life. Human emotions are intended to be shared and understood by others. The local music library of the user is initially sorted in accordance with the feelings the album arouses. The lyrics of the music are frequently taken into consideration to ascertain this. This paper discusses in detail the methods for human emotion detection that are available for use in developing emotion-based music players, the method a music player uses to detect human emotions, and the best way to use the proposed system for emotion detection. Additionally, it gives a brief explanation of how our systems work, how to create playlists, and how to classify emotions.

[5]proposed two significant categories for facial feature extraction, which included Appearance-based feature extraction and geometric based feature extraction, which included extraction of some essential points of the face such as mouth, eyes, and eyebrows.Nikhil et al.

[6] came up with an algorithm that gives a list of songs from the user's playlist in accordance with the user's emotion. The algorithm which was designed was focused on having less computational time and also thus reduces the cost included in using various hardware. The main idea was to segregate the emotions into five categories i.e., Joy, sad, anger, surprise and fear also provided a highly accurate audio information retrieval approach that extracted relevant information from an audio signal in less time. Aditya et al.

[7] focused on creating a system that fetches the emotion of the user using a camera and then automates the result using the emotion detection algorithm. This algorithm captures the mood of the user after every decided interval of time as the mood of the user may not be the same after some time; it may or may not change. The proposed algorithm on an average calculated estimation takes around 0.95-1.05 sec to generate an emotionbased music system, which was better than previous existing algorithms and reduces the cost of designing. Chang Liuet al

[8]. Emotions are a basic part of human nature. They play a vital role throughout life. In this paper, the emotion recognition problem is taken into account as arousal and valence prediction from multi-channel physiological signals
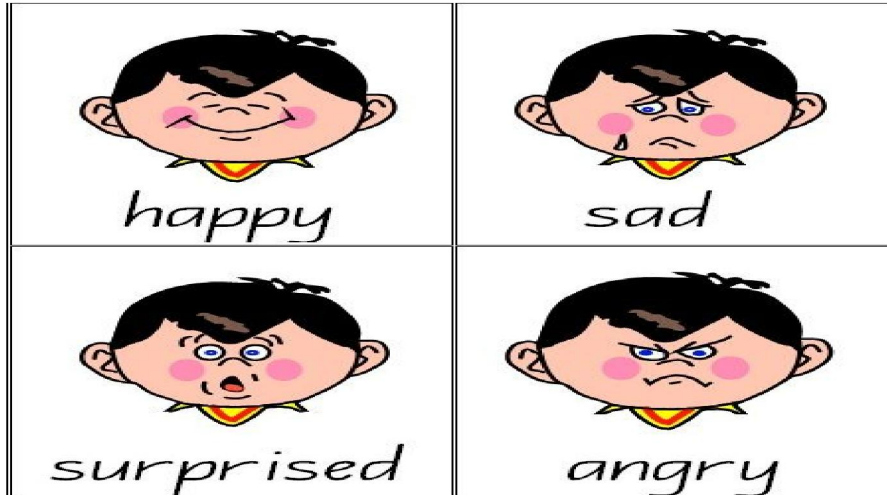
III. METHODOLOGY

In order to classify user's sentiment, the suggested system extract facial landmarks by detecting user's facial expressions.. After the emotion has been identified, the user will be shown songs that match their emotions.

Facial Expression Based Music Player is a great tool for music fans who have a smartphone and access to the internet. The application is accessible to the one who creates profile on system. The application is meant to address the following user needs, as listed below:

- Registering for an account or signing up, and then logging in
- Adding music
- Discarding songs

- Updating the music
- Recommendations and a personalized playlist
- Emotions Capture

Music-based human expression encompasses a wide range of methodologies and approaches depending on the specific context and purpose. Here are some commonly employed methodologies in music expression:

1. Composition: Composers create music by combining different elements such as melody, harmony, rhythm, and texture. They often draw inspiration from personal experiences, emotions, or abstract concepts and use various musical techniques to convey their intended message or evoke specific emotions in the listener.
2. Performance: Musicians bring music to life through performance. This can involve playing an instrument, singing, or conducting an ensemble. Performance allows musicians to infuse their interpretation, expression, and individual style into the music, conveying their emotions and artistic vision to the audience.
3. Improvisation: Improvisation involves creating music spontaneously without prior planning or composition. It allows musicians to explore their creativity, respond to the moment, and express themselves in real-time. Improvisation is commonly associated with jazz, blues, and certain styles of traditional music.
4. Songwriting: Songwriters combine music and lyrics to create songs. They often draw from personal experiences, observations, or storytelling to express their thoughts, emotions, or narratives. Songwriting provides a platform for artists to convey their unique perspectives and connect with listeners through relatable and meaningful content.
5. Recording and Production: Recording and production techniques play a crucial role in music-based human expression. Artists work with sound engineers and producers to capture their performances or compositions in a recorded format. During the production process, various creative decisions are made regarding instrumentation, arrangements, mixing, and mastering to enhance the expressive qualities of the music.
6. Collaboration: Collaboration is a powerful methodology that allows musicians to combine their unique talents and perspectives. Working with other musicians, composers, or producers can spark new ideas, push creative boundaries, and result in a collective expression that merges different artistic visions.
7. Cross-disciplinary Approaches: Some artists integrate music with other art forms such as dance, visual arts, theater, or film to create multi-dimensional experiences. These interdisciplinary collaborations enhance the expressive possibilities of music and provide new avenues for self-expression.

It's important to note that these methodologies are not mutually exclusive, and many musicians employ a combination of approaches to express themselves fully. The specific methodology chosen depends on the artist's creative vision, cultural context, genre, and the intended audience or purpose of the music.
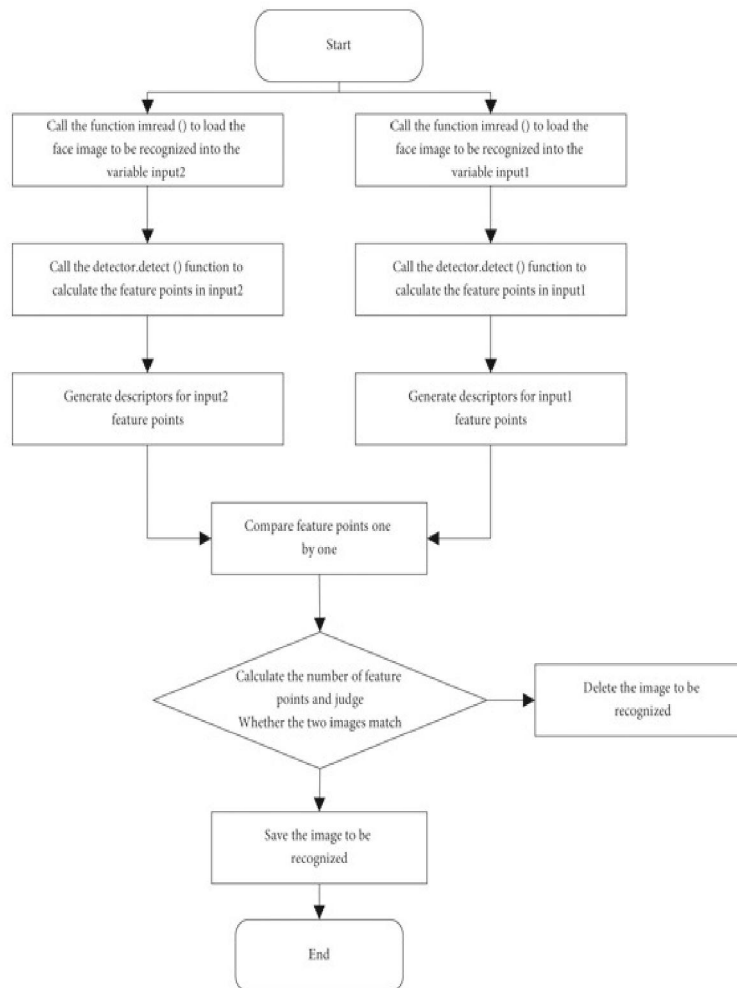
IV. RESULT

Music is a form of artistic expression that encompasses a wide range of emotions, themes, and styles. It has the power to evoke strong emotions, create connections, and convey complex messages. The result of music based on human expression can vary greatly depending on the intentions, skills, and creativity of the musicians. Here are a few possible outcomes:

1. Emotional resonance: Music can reflect and amplify human emotions. Whether it's a melancholic melody that captures feelings of sadness or a joyful rhythm that uplifts spirits, music has the ability to resonate with listeners on an emotional level. When musicians express their own emotions through music, it can create a deep connection with the audience, who may also relate to those feelings.

2. Personal storytelling: Musicians often draw inspiration from their personal experiences, and through music, they can tell their own stories. By expressing their thoughts, struggles, and triumphs, musicians can create songs that resonate with others who have had similar experiences. These personal narratives can be empowering, cathartic, or thought-provoking, offering listeners a glimpse into the artist's perspective.

3. Social commentary: Music has long been a platform for social and political commentary. Musicians can use their craft to express their views on various issues, such as inequality, injustice, or environmental concerns. By weaving these messages into their music, artists can raise awareness, spark conversations, and inspire action among listeners. Songs like Bob Dylan's "Blowin' in the Wind" or Marvin Gaye's "What's Going On" are examples of music that tackled social issues and had a profound impact.

4. Cultural preservation and celebration: Music plays a significant role in preserving and celebrating cultural heritage. Musicians can express their cultural identity through the sounds, rhythms, and instruments they incorporate into their music. By embracing and sharing their cultural roots, they contribute to the richness and diversity of the musical landscape. This type of expression helps to keep traditions alive and fosters a sense of pride and belonging within communities.

5. Innovation and exploration: Music is a constantly evolving art form, and musicians often push boundaries, experiment with new sounds, and challenge established norms. Through their expression, they can introduce innovative techniques, genres, or fusion of styles. This exploration of new musical territories contributes to the evolution of music, inspiring future generations to think creatively and push the boundaries even further.

It's important to note that the result of music based on human expression is subjective and can be interpreted differently by each listener. The impact and significance of music depend on personal taste, cultural background, and individual experiences. Nonetheless, the power of music to connect people and convey human expression remains a universal and profound aspect of the art form.
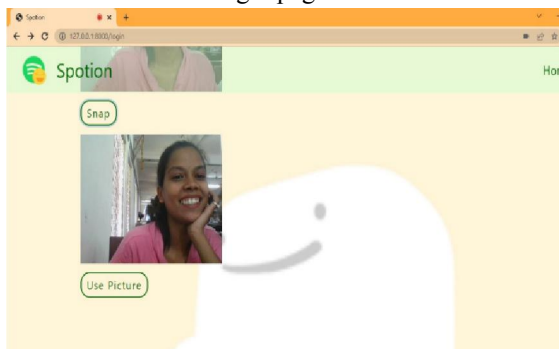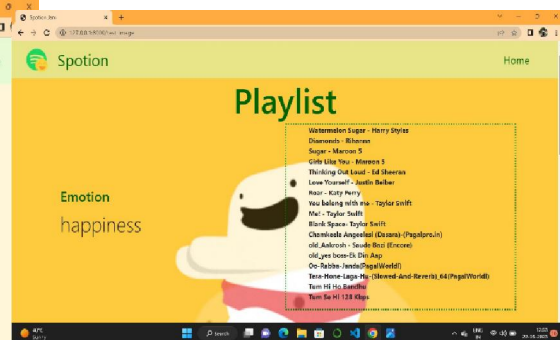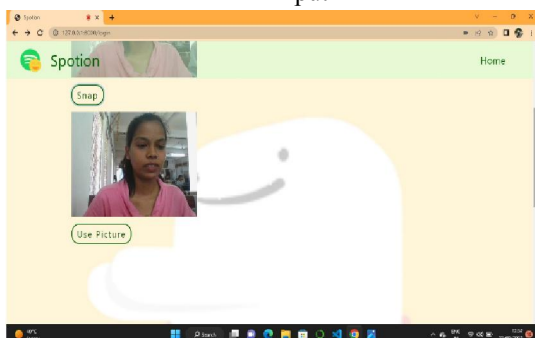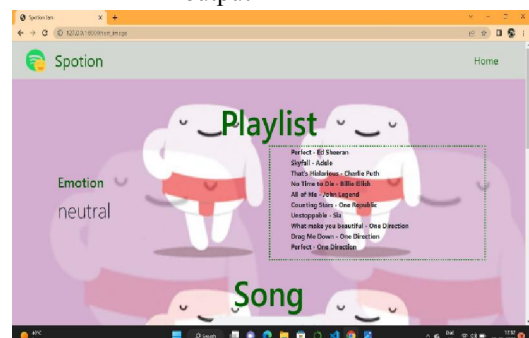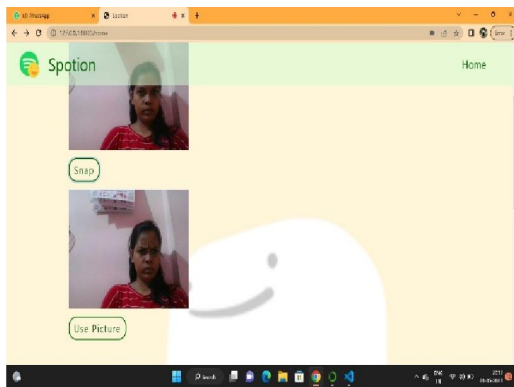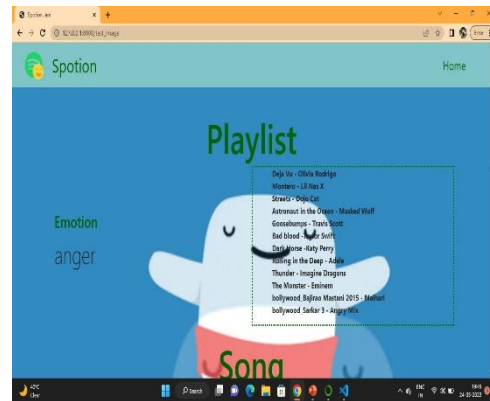
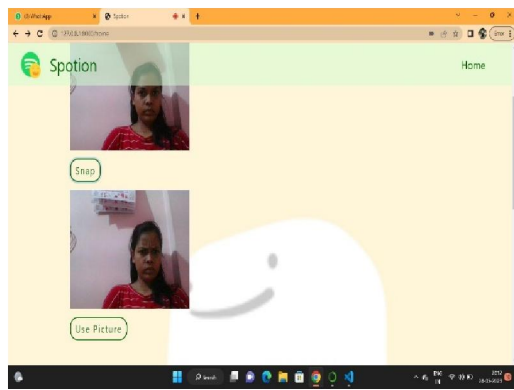Results
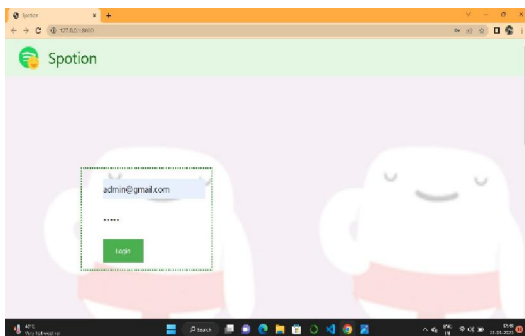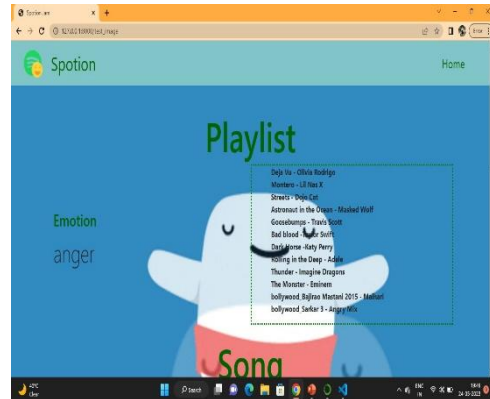

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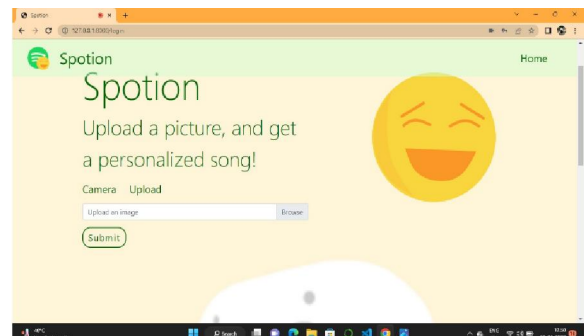
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V. CONCLUSION

As proposed in this paper, a music player which plays songs according to the user's emotion has been designed. The system has been divided into different modules for implementation which includes face detection, emotion detection and song classification. The proposed system is designed as an emotion aware application which provides a solution to the tangible approach of manual segregation of large playlists. Implementation of static face detection is done using Viola Jones Algorithm and testing of the same was done using images from different facial datasets. Dynamic face detection will be implemented as future work so that users can analyse emotions real time and such an application involves computational complexity and larger amount of dataset for getting higher accuracy level. The CNN classifier is designed in such a way that 4 emotion labels can be recognized: happy, anger, sad and neutral and more emotions can be worked for in the future.

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