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EMOTION BASED MUSIC PLAYER USING FISHER FACE MACHINE LEARNING ALGORITHM

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ABSTRACT: Recent Studies display that human beings reply to song, and this song and this song has a robust impact on human mind activity. The common city human listens as much as 4 hours of song each day. People pay attention to song primarily based totally upon there temper and interests. This mission specializes in developing an app to play users' songs primarily based totally on their temper with the aid of using shooting a facial expression. Computer visualization is an interdisciplinary discipline that facilitates to carry a high-stage knowledge of virtual pix or video to computers. In this device, pc imaginative and prescient additives are used to decide the consumer's emotion with the aid of using facial expression. When feelings are detected, the device performs a music of that emotion, saving plenty of consumer time with the aid of using deciding on and gambling the songs themselves. Sentiment primarily based totally song gamers additionally comply with the info of the music and feature genres like linear mode and random mode.

Keywords *– OpenCV-Python, Emotional Recognition, Web Camera, Web Application.*

1. INTRODUCTION

Music is an important form of entertainment these days. With the advancement of technology, the improvement of human activity has received much attention. There are many music players these days that require you to manually select songs and order songs. Users, have to create and

update play-list for each mood, which is time consuming. Some music players have advanced features such as providing lyrics by artist or genre and suggesting similar songs based on artist or genre. While these features are useful for users, there is room for improved in the field of automation when it comes to music player apps. It automatically plays songs and compositions based on the users mood to provide a better experience for the user. This can be gained through the system reacting to the user's emotion, saving time that would have been spent entering information manually. In order for the system to understand user status, we use facial expressions Using the web camera, we can capture the user's facial expression. There are many sensory systems that take an image as input and determine the emotion. For this application, we are using Fisherface classifier class for recognition of emotion.

With the development of multimedia and technology, in modern society various music players are being developed with features like fast forward, reverse, variable playback speed (search & time compression), local playback, streaming playback using multicast streams. Thesefeatures meet the basic needs of users, but users still have challenges of manually searching through the playlist of songs and select songs based on user's current mood. Audio Sentiment Recognition (ASR) and Music Recovery (MIR) presentations in traditional music players automatically classify playlists based on different sentiment categories. OBJECTIVE The project Emotion based music player is a good approach that helps the user to automatically play songs based on the emotions of the user. Identifies the user's facial expressions and plays songs based on their emotions. The emotions are recognized using a machine learning method Linear discriminant analysis (LDA). The human face is an important part of individual's body and it plays an important role in extraction of an individual's behavior's and emotional state. Your Webcam captures facial features. It then determines the person's facial features from the captured image. Emotionally, song will be played from a predefined path.

2. LITERATURE REVIEW

Open-CV is a large open source of computer vision, machine learning, and image processing. Open-CV supports various editing languages such as Python, C ++, Java, etc. It can process photos and videos to see objects, faces, or even handwriting. When combined with a variety of libraries, such as Numpy which is a well-designed library of numerical uses, the number of weapons grows in your Arsenal that is, anywork one can do at Numpy can be integrated with Open-CV.

[1]Chang, C. Hu, R. Ferris, and M. Turk, ―Manifold based analysis of facial expression,

Image Vision Compute ,IEEE Trans. Pattern Anal. Mach. Intel. vol. 24, pp., expression dynamics are learned for tracking and classification.The image observation likelihood is derived from a variation of the Active Shape Model (ASM) algorithm.

[2].Byeong-jun Han, Seungmin Rho, Roger B. Dannenberg and Eenjun Hwang, ―SMERS: music emotion recognition using support vector regression‖, 10thISMIR, 2009.The result indicates the SVR classifier in the polar representation produces satisfactory result which reaches 94.55% accuracy superior to the SVR (in Cartesian) and other machine learning classification algorithms such as SVM and GMM

[3]Carlos A. Cervantes and Kai-Tai Song, ―Embedded Design of an Emotion-Aware Music Player‖, IEEE International Conference on Systems, Man, and Cybernetics, pp 2528-2533,2013.Human-robot interaction(HRI) design is proposed where emotional recognition from the speech signal is used to create an emotion-aware music player that can be implemented in an embedded platform

[4] Fatma Guney, ‖Emotion Recognition using Face Images‖, Bogazici University, Istanbul, Turkey 34342. Explains how six basic human emotions can be recognized in various face images of the same person, as well as those available from benchmark face image databases like CK+, JAFFE, MMI,

[5]Facial Recognition Technology a Clear and Concise Reference.Contains extensive criteria grounded in past and current successful projects and activities by experienced Facial Recognition Technology practitioners.

[6] Samuel Strupp, Norbert Schmitz, and KarstenBerns, ―Visual-Based Emotion Detection for Natural Man-Machine Interaction. This paper presents a camera-based system for the detection of emotions of a human interaction partner.

3. METHODOLOGY

Here the existing system is nothing but Current music players have features play, pause, shuffle, play next, play previous. APPLE MUSIC: the well-known worldwide music streaming application. The advantage of this app is the popular music suggestion for users; However, registration costs are very high.

SPOTIFY: It is a worldwide music streaming application. It also suggests songs based on user data collection. In addition, the cost of registering is much cheaper than apple music.

WYNK MUSIC: An app to stream and download music for all moods. It has over 108 million songs in Indian and international music. Listen and download songs by genre, mood,

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artist or simply think of tune in to one of the many radio stations.

Disadvantages:

• Personal choice of songs.

• Party push

• Playlist

• Randomly playing songs may not match your mood

• User has to classify the songs based on the emotion and then for playing the songs the user has to opt the song.

The foremost concept of this project is to automatically play songs based on the emotions of the user. It aims to provide user-friendly music about the emotions experienced. In existing system user has to manually select the songs ,randomly played may not match to the mood of the user, the user has to split the songs into many emotions and then by playing the songs the user chooses himself.

Advantages:

• Efficient feature selection

• Fast feature computation

• Ease of use

• Mixed mood detection

• Improved accuracy

• Reduced computational time

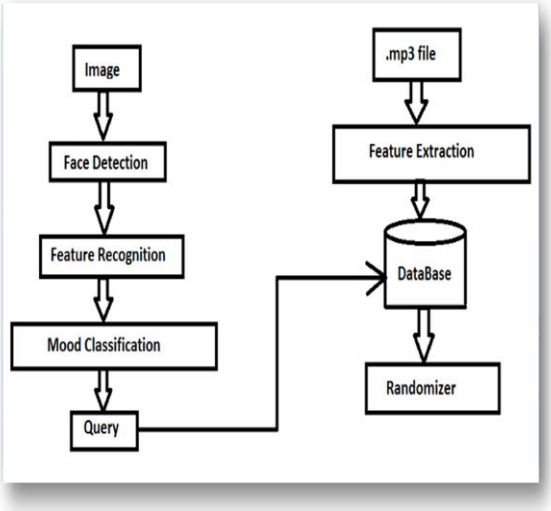

Fig.1: System architecture

A diagram of a system structure will be used to show the relationships between the various components. They are typically created for systems that contain hardware and software and are diagrammed to show the interaction between them. However, it can also be created for web applications.

4. IMPLEMENTATION

Facial expression detection in Fisherface works with the help of trained models. The reason for this is to allow the user to retrieve the database depending on its usage. Suppose we take a large amount of data about 25-30k it will provide

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good accuracy no doubt but if the situation is similar that the user of the devices are a few people. Now in that case if we take an accurate database with about 400-450 images as user-related and will provide better accuracy with the benefit of a smaller amount of data and less memory on it . As well as a small amount of data memory provides a faster output that results in faster response time.

FisherFaces is an improvement over EigenFaces and uses Principal Component Analysis (PCA) and Linear Discriminant Analysis (LDA).

The general steps involved in face recognition are :

1. Capturing
2. Feature extraction
3. Comparision
4. Match/non-match

OpenCV has three built-in face recognizers. We can use any of them by a single line of code. The recognisers are :

- EigenFaces – cv2.face.createEigenFaceRecognizer()
- FisherFaces-

  cv2.face.createFisherFaceRecognizer()
- Local Binary Patterns Histograms (LBPH) – cv2.face.createLBPHFaceRecognizer()

  Fisher face algorithm:

- Let X be a random vector with samples drawn from c classes:

  x= {x1,x2,...,xc}

xi={x1,x2,...,xn}

$$S_B = \sum_{i=1}^{c} N_i(\mu_i - \mu)(\mu_i - \mu)^T$$

$$S_W = \sum_{i=1}^{c} \sum_{x_j \in X_i} (x_j - \mu_i)(x_j - \mu_i)^T$$

- matrices S_{B} and S_{W} are calculated as:

Fisher's classic algorithm now looks for a projection W, that maximizes the class separability criterion:

$$W_{opt} = \arg\max_W \frac{|W^T S_B W|}{|W^T S_W W|}$$

A solution for this optimization problem is given by solving the General Eigenvalue Problem:

$$S_B v_i = \lambda_i S_w v_i$$

$$S_W^{-1} S_B v_i = \lambda_i v_i$$

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The optimization problem can then be written as:

$$W_{pca} = \arg\max_W |W^T S_T W|$$

$$W_{fld} = \arg\max_W \frac{|W^T W_{pca}^T S_B W_{pca} W|}{|W^T W_{pca}^T S_W W_{pca} W|}$$

• The transformation matrix W, that projects a sample into the (c-1)- dimension space is then given by:

$$W = W_{fld}^T W_{pca}^T$$

5. EXPERIMENTAL RESULTS

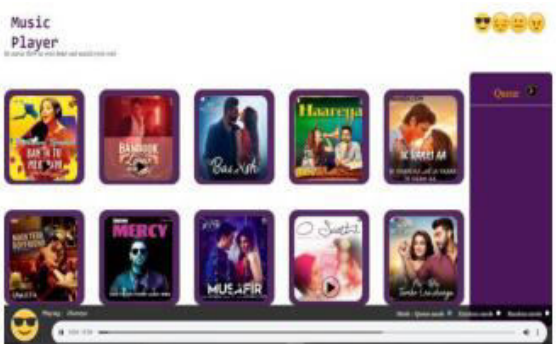

Fig.2: Emotion Based Music Player playing Happy song

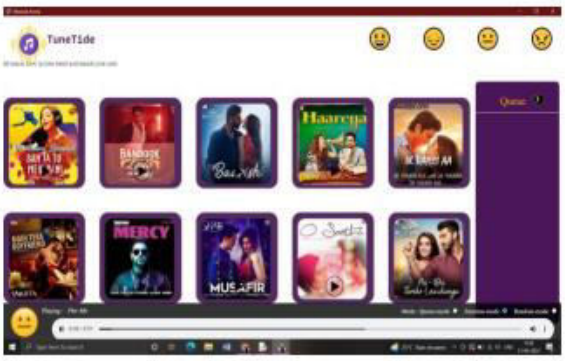

Fig.3: emotion based music player playing neutral song

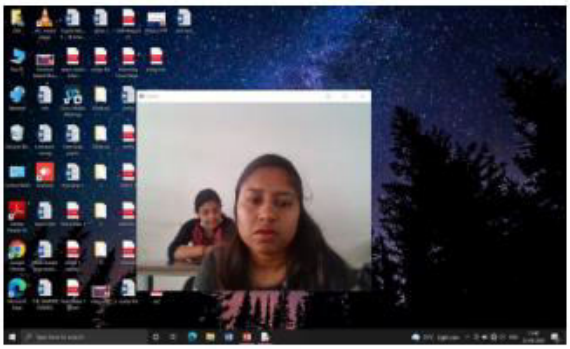

Fig.4: Emotion detection as neutral

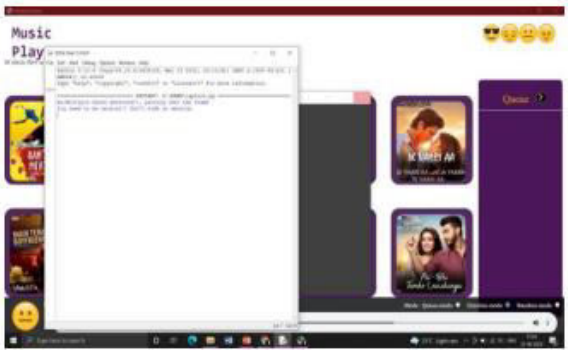

Fig.5: A message displayed to user after emotion detection and song recommendation

6. COCLUSION

Emotional Music Player is used to automate and give a better music player experience to the end user. The app solves the basic needs of music listeners without bothering them like existing apps create: uses technology to increase system-user interaction for many ways. It simplifies the end user's work by taking a photo using the camera, to articulate their feelings, and to

promote customized playlists through the most advanced and collaborative play. This project is developed to give us great advancement in the field of machine learning technology. Emotion based music player fulfils to sort out the music based on the emotions of the user such as whether it is happy or sad or angry. Therefore, our mission is entirely aimed at developing a user-based and assisted player revive in case of free time.

REFERENCES

[1]. Chang, C. Hu, R. Ferris, and M. Turk, ―Manifold based analysis of facial expression, Image Vision Compute ,IEEE Trans. Pattern Anal. Mach. Intel. vol. 24, pp.

[2]. Byeong-jun Han, Seungmin Rho, Roger B. Dannenberg and Eenjun Hwang, ―SMERS: music emotion recognition using support vector regression, 10thISMIR, 2009.

[3]. Carlos A. Cervantes and Kai-Tai Song, ―Embedded Design of an Emotion-Aware Music Player, IEEE International Conference on Systems, Man, and Cybernetics, pp 2528-2533 ,2013.

[4]. Fatma Guney, Emotion Recognition using Face Images, Bogazici University, Istanbul, Turkey 34342.

[5]. Facial Recognition Technology a Clear and Concise Reference.

[6]. Samuel Strupp, Norbert Schmitz, and KarstenBerns, ―Visual-Based Emotion Detection for Natural Man-Machine Interaction.