Special Issue on Research and Innovations in Science and Engineering
Volume: 5 Issue: 12s
ISSN: 2454 - 4248
101 - 104

Emotional Based Music System Using Facial Recognization

Prof. Kranti S. Bhoyar
ENTC Department
MGICOET, Shegaon, India
krantimauli@gmail.com

Prof. Nilesh. M. Verulkar
ENTC Department
MGICOET, Shegaon, India
nileshverulkar@gmail.com

Pranali K. Chavan
ENTC Department
MGICOET, Shegaon, India
kchavanpranali@gmail.com

Aishwarya M. Karande
ENTC Department
MGICOET, Shegaon, India
aishwaryakarande7@gmail.com

***Abstract*—**Music plays an important role in an individual's life. It controls the mood of a person.It helps to reduce stress, improves the happiness and causes good effect on health of user. In traditional method grouping of songs was based on personal selection but this method is about grouping of songs and to develop emotion based music player. This paper focus on a system with such capabilities used to generate segmentation of song which describe a specific emotion of user. It presents a method of face detection and feature extraction of face. Then face image are classified and segment of audio playlist are selected according to user emotion. This paper mainly focus on histogram oriented gradient , discrete wavelet transform and support vector machine classifier with these algorithms the emotional based music player using face recognization process is done, the music player follows the emotions of the user through the capture image by web cam and the audio playlist will be played according to the mood of user. It gives brief idea about our systems process, image detection, and feature extraction and emotion classification. This technology increases the interaction of the system with the user in many ways.

Keywords-face detection, feature extraction, image classification, emotion

*****

I. INTRODUCTION

Music plays important role in human life .Music can raises our mood, it improves our understanding capabilities. There are many types of music, it enhances our mood and feels us relax. Music acts as a stress remover for us it makes us clam and relax.

In today's world music can be accessed from anywhere and at any time. We listen to music while walking on the road, while doing the household chores. Moreover, we listen to different kinds of music on different occasions. Music is a powerful stimulus capable of influencing our emotions.

In a conventional music player, a user had to select play list manually according to his mood ,which is time consuming process but now with the help of this method, it categories the audio play list based on the different types of emotions. This paper is based on identification of human emotions and plays audio play list according to that emotional state beacause face betrays what a person is actually feels.

In this system, input image is captured by using web cam and provided for face detection, it uses Histogram of oriented gradients for face detection. This technique considers the occurrences of gradient oriented in local portions of an image - detection window, or region of interest (ROI). Discrete wavelet transform is used for feature extraction of face. By creating and joining different feature points on chin, cheeks, lips, forehead, etc. the face chip is created and provided to support vector machine classifier for the classification of emotions like anger, fear, disgust, sadness, happiness and surprise. The emotion which is classified by SVM is then provided to music player and its according audio play list will play.

II. LITERATURE SURVEY

Prof. Vijaykumar R. Ghule, Abhijeet B. Benke, and "Emotion Based Music Player Using Facial Recognition" in this paper they used Histogram oriented gradient for face detection and used genetic algorithm gives optimized value of eye, eyebrow and lip feature then the classification is done based on eye and lip classification. [3]

Prof. L. J. Sankpal, Yash Bagadia "Advanced Music Player with Integrated Face Recoganization Mechanism" in this paper they introduced music player application which runs on user mobile phone. Android operating system and strong, high quality processor are needed to use this application. There are two phases after the installation of the music player application. The first phase is the training phase. In this phase, the user imitates some expressions which the application asks him and each of these expressions will be mapped to a specific emotion. According to the emotions, playlists is created. After the training phase is over, the user can start listing to the music. This can be done by selecting the camera button in the app. The camera then senses the emotion of the user. Then the app plays a playlist accordingly [6].

Anagha S. Dhavalikar and Dr. R. K. Kulkarni Proposed "Automatic Facial Expression recognition system". This system consist of three phases 1.Face detection 2. Feature Extraction and 3.Expression recognition. The First Phase Face detection is done by YCbCr Color model, lighting compensation for getting face and morphological operations for retaining required face i.e eyes and mouth of the face. AAM i.e Active Appearance Model is also used by this system. In this method the point on the face like eye, eyebrows

ISSN: 2454 - 4248
101 - 104

and mouth are located and it create a data file which gives information about model points detected and detect the expression of face [9].

Yong-Hwan Lee,Woori Han and Youngseop Kim proposed "Emotional Recognition from Facial Expression Analysis using Bezier Curve Fitting" this system based on Bezier curve fitting. This system used two phases for facial expression and emotion first is detection and analysis of facial area from input original image and next phase is verification of facial emotion of caracteristics feature in the region of interest. The first phase for face detection uses colour still image based on skin colour pixel by spatial filtering based on result of lighting compassion then to estimate face position and facial location of eye and mouth. This system extracts points of the feature map to apply Bezier curve on eye and mouth. Interactive and easy to use music player without taking efforts for selecting songs manually is designed. It helps to reduce the searching time for music, reducing the unnecessary computational time and therefore increasing the overall accuracy and efficiency of the system [10].

III. PROPOSED SYSTEM

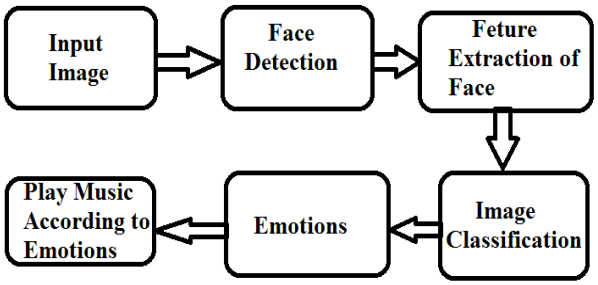

Figure 1:- Block Diagram of Emotion Based Music Player

The input image is captured with the help of web cam to identify the emotions of the user. There are different types of emotions like sad, happy, anger, neutral and frustration etc.

A. FACE DETECTION:

The image should be recognizable for the system to detect face. The system should read faces in low light but if the light is below certain accepted limit the system gives a prompt to retake as no face is detected. The histogram of oriented gradient has been widely and successfully used for face detection. It detect the all locations in the image and divide the image into small connected regions known as cells which is is used to detect the edge as well as histogram gradient directions. The each cell size is 8x8 the grouping of cells called as blocks and the block size is 16x16 which is then represented as histogram.

B. FEATURE EXTRACTION OF FACE:

Detection of emotions is obtained by extracting the feature of the face. The feature extraction of face is done using the discrete wavelets transform. It is wavelet transform for which the wavelets are discretely sampled.DWT is used for the removal of noise and compact the large amount of data.

C. DATABASE CREATION:

Database should accurately justify the generalized nature of human face. Images of human face in the database should be accurate. It consist of variety of face structure and different face expressions. It should contain face of adult male and female. If the system recognizes and processes different types of face structure it will more generic in nature and system can be generalized with high performance. The database is categorized into happy, sad, neutral, anger, etc.

D. IMAGE CLASSIFICATION:

Support vector machine is used for classification of human faces. SVM is an algorithm that takes data as an input that is human faces and at the output it separates those emotions according to human faces. SVM predict the mood of human.

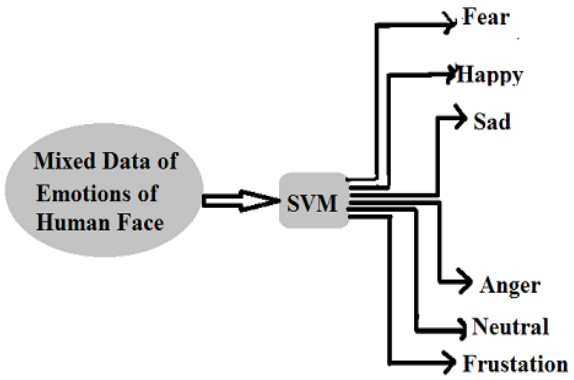

Figure 2: SVM Classifier

E. MUSIC CLASSIFICATION:

The predicted mood of the user is used for classification of songs and to create an audio playlist for the different types of mood. Songs are categorized into different groups like instrumental, classical, acoustic, melodic, vocal, energetic, rap, soft musical, slow, etc. Songs are separated into different playlists based on the feature extraction process. Hence lists of similar sounding songs or songs belonging to similar genres are generated.

According to the emotions the audio playlist will play.

V. TECHNIQUES FOR FACIAL RECOGNIZATION

a. Histogram Oriented Gradient (HOG)
b. Discrete Wavelet Transform
c. Support Vector Machine (SVM)

ISSN: 2454 - 4248
101 - 104

a. Histogram Oriented Gradient (HOG)

The histogram oriented gradient is used for face detection. The detected image is converted into small square cell, compile HOG in every cell, the group of adjacent cells called as blocks and this grouping represents block histogram. It counts the gradient orientation and region of interest of an image. The human face pattern contain facial components configuration, edges, face sizes and face orientation that detected by the HOG. The histogram gradient captures the structure of image then detects the dimensions of lips, mouth, eyes, and eyebrows.

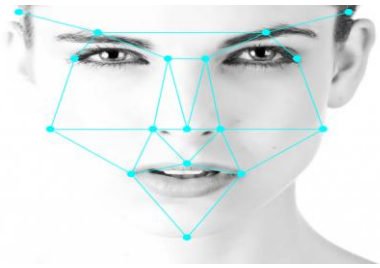

Figure 3: Histogram Oriented Gradient

b . Discrete Wavelet Transform

The discrete wavelet transform is used for feature extraction process. DWT reduces noise, attenuate the signal with the help of filters. DWT allow decomposition of image into different levels of resolution and data compression. In the DWT two types of image compression is done first is lossless compression which reduces image size with no information is lost, it is used to recreate exact replica of original image and second is lossy compression which removes data form original image. A new feature set is introduced that is based on the analysis of wavelet coefficients.

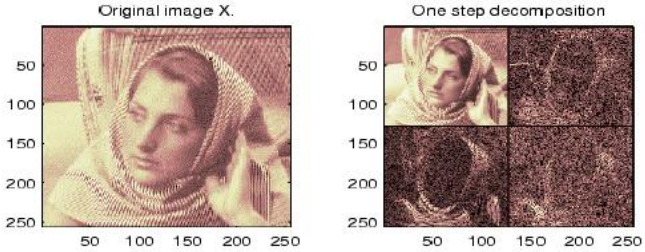

Figure 4: Discrete Wavelet Transform

c. Support Vector Machine(SVM)

Support Vector Machine is used for the image classification. SVM is the binary classification algorithm. The web cam captures the image of user then extracts features of face. The classification is based on database of elliptical value of nose, eyes, mouth, lips. The training data that means the input image captured by web cam compare with test data which is stored in database then it classify by support vector machine. The SVM classifier predict the different emotions of the human through the calculations of distance from eye, mouth, lips, eyebrows and after the classification music will play.

Figure 5: Facial Expression Classification

IV. CONCLUSION AND FUTURE SCOPE

This paper introduces the emotional based music system using facial recognization. The emotion based music system will be of great advantage to users looking for music based on their mood and emotional behavior. The system works using the histogram oriented gradient, discrete wavelet transform and support vector machine to play song based on recognized mood of user. Input image is captured by web cam and it is detected by the HOG then the facial extraction is done and classify the image by the SVM classifier according to the database, the emotion is classified.

Thus it reduces the efforts of user of creating and managing playlist. It provides better enjoyment to the music listeners by providing the most suitable or appropriate song to the user according to his/her current emotion. So, totally our work aims to develop a music system which is based on user need and it helps to reduce the searching time for music, reducing the unnecessary computational time and therefore increasing the overall accuracy and efficiency of the system.

In future music system can design with the mechanism that will be helpful to identify the mood of a group of persons rather than individual. The system with some additional features can act as a mood lifter or mood enhancer.

REFERENCES

[1] Mahek Gupta, Shreya Singhal, Mohit Pandey “Real time emotions recognition and analysis based music player” Gupta Mahek et al.; International Journal of Advance Research, Ideas and Innovations in Technology 2019

[2] Pratik Gala, Raj Shah, Vineet Shah “MoodyPlayer : A Music Player Based on Facial Expression Recognition” International Research Journal of Engineering and Technology (IRJET) April 2018

[3] Prof. Vijaykumar R. Ghulg, Abhijeet B. Benke, Shubham S. Jadhav “Emotion Based Music Player Using Facial Recognition” in International Journal of Innovative Research in Computer and Communication Engineering feb 2017

[4] Husain Zhafar, Shlok Gilda “Smart Music Player Integrating Facial Emotion Recognization and Music Mood Recommendation” 2017 International Conference on Wireless Communications,Signal Processing and Networking (WiSPNET)

[5] Abhishek R. Patel, Anusha Vollal, Pradnyesh B. Kadam “MoodyPlayer: A Mood based Music Player” in International Journal of Computer Applications (0975 – 8887)
Volume 141 – No.4, May 2016.

[6] Yash Bagadia, Parul Tambe, Noorulain S. Haikh , Prof. L. J. Sankpal5 “Advanced Music Player With Integrated Face

ISSN: 2454 - 4248
101 - 104

Recognition Mechanism" in International Journal Of Innovative Research In TechnologyJune 2016

[7] Prof. Jayshree Jha , Akshay Mangaonkar , Deep Mistry "Facial Expression Based Music Player" International Journal of Advanced Research in Computer and Communication Engineering Vol. 4, Issue 10, October 2015

[8] Hafeez Kabani, Sharik Khan, Omar Khan, Shabana Tadv, "Emotion Based Music Player" International Journal of Engineering Research and General Science Volume 3, Issue 1, January-February, 2015

[9] Anagha S.Dhavalikar and Dr. R. K. Kulkarni, "Face Detection and Facial Expression Recognition System" 2014 Interntional Conference on Electronics and Communication System (ICECS -2014).

[10] Yong-Hwan Lee , Woori Han and Youngseop Kim, "Emotional Recognition from Facial Expression Analysis using Bezier Curve Fitting"2013 16th International Conference on Network-Based Information Systems.

[11] G. Heamalathal, C.P. Sumathi, A Study of Techniques for Facial Detection and Expression Classification, International Journal of Computer Science & Engineering Survey(IJCSES) Vol.5, No. 2, April 2014.

[12] Anukriti Dureha "An Accurate Algorithm for Generating a Music Playlist based on Facial Expressions" in International Journal of Computer Applications (0975 – 8887)
Volume 100– No.9, August 2014

[13] Jyoti Rani, Kanwal Garg, "Emotion Detection Using Facial Expressions -A Review", Volume 4, Issue 4, April 2014 ISSN: 2277 128X International Journal of Advanced Research in Computer Science and Software Engineering.

[14] Abat, F., Maaoui, C., and A.Prusk. Human-computer interaction using emotion recognition from facial expression. 2011 UKSim 5th European Symposium on Computer Modeling and Simulation (2011).

[15] Yao-Jiunn Chen, & Yen-Chun Lin. (2007). "Simple face-detection algorithm based on minimum facial features" Paper presented at the Industrial Electronics. Society, 2007. IECON 2007. 3rd Annual Conference of the IEEE, 455-460.

[16] W. Yuwen, L. Hong, and Z. Hongbin, ″Modeling facial expression space for recognition,″ in Intelligent Robots and Systems, 2005. (IROS 2005). 2005 IEEE/RSJ International .

[17] Viola, P. And Jones, M.J.. "Robust real-time face detection". International journal of computer, vision 57, pp137-154 ,2004.

[18] T. Kanade, J. F. Cohn, and T. Yingli, ″Comprehensive database for facial expression analysis,″ in Automatic Faceand Gesture Recognition, 2000. Proceedings. Fourth IEEE International Conference on, 2000, pp. 46 - 53.