



# **Emotion Based Music Player through Face Recognition System**

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**ABSTRACT:** The goal of this paper is to build a mood detect system which can analyze basic facial expression of human. In this project a method is presented for mood detection based on humans face emotions. The proposed method used the humans face to identify the mood of that human and finally using this result play the audio file which related to human's mood. Firstly system takes the human face as input then the further process will going on. That is we use here Principle Component Analysis Algorithm (PCA) to recognize the human face. This algorithm helps to recognize the human's mood using feature of face image. Through the feature detection of lip, mouth, and eyes, eyebrow, those feature points are found. If the input face will matches exactly to the emotions base dataset face then we can identify the humans exact mood to play the mood related audio file. Recognition under different environmental conditions can be achieved by training on limited number of characteristics faces. The proposed approach is simple, efficient, and accurate. This system gives accurate result as compare to existing approach. System play's very important role in recognition and detection related field. That is this gives important result very quickly as compare to traditional methods.

**KEYWORDS:** PCA, Face Detection, Feature Extraction.

## **I. INTRODUCTION**

One of the most interesting areas of human computer interaction is face detection and identification. Distinguishing facial features are comparatively low and it is most interesting task to observe these. Detection and identification face objects from face is a challenging task.

Finding a humanmood using human's face which can be one of the most challenging assignments you will handle in your career. A face is the best way to detect and recognize a human. No recognition algorithms will work without face detection step. Rate of detection affects the recognition stage. With all these noise is a very intriguing task to detect and localize an unknown non-face from still image.

Mood detection based on emotion is the one of the current topic in the various fields which provides solution to various challenges. Beside traditional challenges in captured facial images under uncontrolled settings such as varying poses, different lighting and expressions for face recognition and different sound frequencies for emotion recognition. For the any face and mood detection system database is the most important part for the comparison of the face features and sound Mel frequency components. For database creation features of the face are calculated and these features are store in the database. This database is then use for the evaluation of the face and emotion by using different algorithms.

Face mood detection applications is still a challenging task since face images may be affected by changes in the scene, such as pose variation, face expression, or illumination. The main goal to propose this system is to find the humanmood with the help face image as input and after that using these mood results to play the audio file. A face recognition technique which is used here to matches the train face image to the original input face image.

The proposed approach is simple, efficient, and accurate. This system gives accurate result as compare to existing approach. System play's very important role in recognition and detection related field. That is this gives important result very quickly as compare to traditional methods.



# International Journal of Innovative Research in Computer and Communication Engineering

*(A High Impact Factor, Monthly, Peer Reviewed Journal)*

Website: [www.ijircce.com](http://www.ijircce.com)

Vol. 6, Issue 1, January 2018

## BACKGROUND:

Emotional aspects have more impact on Social intelligence like communication understanding, decision making and also helps in understanding behavioral attitude of human. Emotion play important role during communication. Emotion recognition is implemented out in diverse way; it may be verbal or non-verbal. Voice (Audible) is verbal way of communication & Facial expression, action, body postures and gesture is non-verbal form of communication. Human can recognize emotions without any meaningful delay and effort but recognition of facial expression by machine is a big challenge.

## AIM AND OBJECTIVES:

This paper works to find the mood of human using facial emotion, comparative study of popular face expression recognition techniques & phases of facial expression. So this work gives the brief introduction towards techniques, application and challenges of emotion recognition system.

## MOTIVATION:

With the help of this research we can identify the human mood using human emotions. So this project is as important to individual as much to public too.

## II. RELATED WORK

This paper proposes a system that will automatically identify the facial expression from the face image and classify emotions for final decision. The system uses a simplified technique called 'Viola Jones Face Detection' technique for face localization. The different feature vectors are club together using a subset feature selection technique to improve the performance of recognition and classification process. Finally the combined features are trained and classified using SVM, Random Forest and KNN classifier technique [1].

The proposed technique use three steps face detection using Haar cascade, features extraction using Active shape Model (ASM) and Adaboost classifier technique for classification of five emotions anger, disgust, happiness, neutral and surprise [2].

In this paper implement an efficient technique to create face and emotion feature database and then this will be used for face and emotion recognition of the person. For detecting face from the input image we are using Viola-Jones face detection technique and to evaluate the face and emotion detection KNN classifier technique is used [3].

This paper objective is to display needs and applications of facial expression recognition. Between Verbal & Non-Verbal form of communication facial expression is form of non-verbal connection but it plays pivotal role. It expresses human related or filling & his or her mental situation [4].

In this proposed system it is attention on the human face for recognizing expression. Many techniques are available to recognize the face image. This technique can be adapted to real time system very easily. The system briefly displays the schemes of capturing the image from web cam, detecting the face, processing the image to recognize few results [5].

In this paper, adopt the recently introduced SIFT flow technique to register every frame with respect to an Avatar reference face model. Then, an iterative technique is used not only to super-resolve the EAI representation for each video and the Avatar reference, but also to improve the recognition performance. Also extract the features from EAIs using both Local Binary Pattern (LBP) technique and Local Phase Quantization (LPQ) technique [6].

In this study, a frame of emotion recognition system is developed, including face detection, feature extraction and facial expression classification. In part of face detection, a skin detection process is support first to pick up the facial region from a complicated background. Through the feature detection of lip, mouth, and eyes, eyebrow, those feature points are launch [7].

In this paper, a new technique for facial emotion recognition is found. The proposal involves the use of Haar transform technique and adaptive AdaBoost technique for face identification and Principal Component Analysis (PCA) technique in conjunction with minimum distance classifier for face recognition. Two techniques have been investigated for facial

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expression recognition. The former relies on the use of PCA and K-nearest neighbour (KNN) classification technique, while the latter advocates the use of Negative Matrix Factorization (NMF) and KNN technique[8].

### III. PROPOSED SYSTEM

The proposed method used the humans face to detect the mood of that human and finally using this result to play the audio file which related to human's mood. Firstly system takes the human face image as input then the further process will going on. That is we use here Principle Component Analysis (PCA) technique to recognize the human face for mood detection. This technique helps to detect the human's mood using feature of face image. Through the feature detection of lip, mouth, and eyes, eyebrow, those feature points are found. If the input face will matches exactly to the emotions based dataset's face then we can detect the humans exact mood to play the mood related audio file. Detection under different environmental conditions can be achieved by training on limited number of characteristics faces.

#### ADVANTAGES PROPOSED SYSTEM:

1. Detect the mood of human using human face image.
2. Face image emotions identification using image features is achieved.

#### PROPOSED SYSTEM ARCHITECTURE

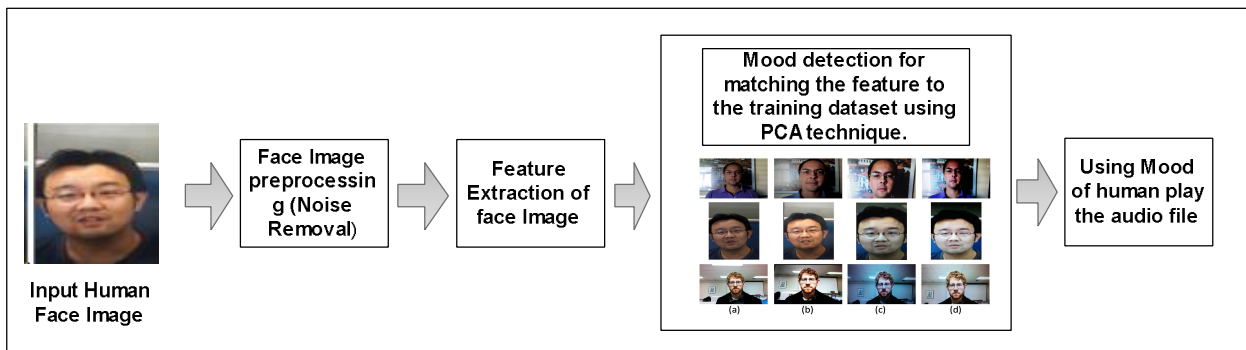


Fig1. Proposed System Architecture

### IV. ALGORITHM

#### PCA ALGORITHM MECHANISM

The principal component analysis (PCA) is a kind of algorithms in biometrics. It is a statistics technical and used orthogonal transformation to convert a set of observations of possibly correlated variables into a set of values of linearly uncorrelated variables. PCA also is a tool to reduce multidimensional data to lower dimensions while retaining most of the information. It covers standard deviation, covariance, and eigenvectors.

#### PCA Steps:

1. Let a face or retina image  $X(x, y)$  be a two dimensional  $m \times n$  array of intensity values. An image may also be considering the vector of dimension  $m \times n$ . Let the training set of images  $\{X_1, X_2, X_3, \dots, X_N\}$ . The average face of the set is defined by

$$\bar{X} = \frac{1}{N} \sum_{i=1}^N X_i$$

2. Calculate the Covariance matrix to represent the scatter degree of all feature vectors related to the average vector. The Covariance matrix  $C$  is defined by

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$$C = \frac{1}{N} \sum_{i=1}^N (X_i - \bar{X})(X_i - \bar{X})^T$$

3. The Eigenvectors and corresponding eigenvalues are computed by using

$$CV = \lambda V$$

Where V is the set of eigenvectors associated with its eigenvalue  $\lambda$ .

4. Sort the eigenvector according to their corresponding eigenvalues from high to low.

5. Each of the mean centered image project into eigenspace using

$$W_i = V_i^T (X_i - \bar{X})$$

6. In the testing phase each test image should be mean Centered, now project the test image into the same eigenspace as defined during the training phase.

7. This projected image is now compared with projected training image in eigenspace. Images are compared with similarity measures. The training image that is closest to the test image will be matched as used to identify.

## Advantage of PCA

- 1) Lack of redundancy of data given the orthogonal components.
- 2) Reduced complexity in images' grouping with the use of PCA.
- 3) Smaller database representation since only the trainee images are stored in the form of their projections on a reduced basis.
- 4) Reduction of noise since the maximum variation basis is chosen and so the small variations in the back-ground are ignored automatically.

## V. RESULT

Let us consider the face image in figure 1. Gray scale conversion is completed which is shown in figure 2 and Median filtering is implemented on the acquired images to get rid of the unwanted noises. The outcomes are displayed in the figure 3 respectively.



Fig. 1 Input Face Image

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Vol. 6, Issue 1, January 2018



**Fig. 2 Gray Image**



**Fig. 3 Noise Removed Image**

After noise remove, next step to detect the actual face. So using cascade classifier, the face detection is done. The outcomes are displayed in the figure 4.



**Fig. 4 Face Detected Image**

After face detection, next step is to crop the detected face from image for feature extraction process. The outcomes are displayed in the figure 5.

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Fig. 5 Face Crop Image

Next, image feature extraction process, all features are extracted from image and using that feature and also training data features to recognized the mood of person.

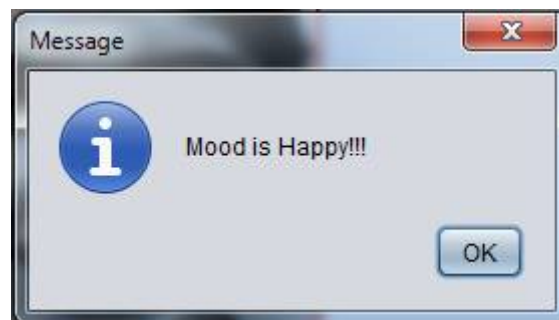


Fig. 5 Mood Detection

## V. CONCLUSION

Identification of a human mood based on human face emotions n has many applications in real life. The face recognition in the images is challenging. In this paper a method has been proposed where the algorithm has been modified for the detection of human mood using the face image, extraction of the feature information and matching the features to the training emotion's based human face dataset. After that using these results to play the audio file which is the additional work. The work can further be extended for improving the recognition accuracy as well as time for large face databases. So our system can perform the very important role in human emotions based mood detection.

## REFERENCES

- [1] J Jayalekshmi, Tessy Mathew, "Facial expression recognition and emotion classification system for sentiment analysis". 2017 International Conference.
- [2] Suchitra, Suja P. Shikha Tripathi, "Real-time emotion recognition from facial images using Raspberry Pi II". 2016 3rd International Conference
- [3] Dolly Reney, Neeta Tripathi, "An Efficient Method to Face and Emotion Detection". 2015 Fifth International Conference.
- [4] Monika Dubey, Prof. Lokesh Singh, "Automatic Emotion Recognition Using Facial Expression: A Review". International Research Journal of Engineering and Technology (IRJET) Feb-2016.
- [5] Anuradha Savadi Chandrakala V Patil, "Face Based Automatic Human Emotion Recognition". International Journal of Computer Science and Network Security, VOL.14 No.7, July 2014.
- [6] Songfan Yang, Bir Bhanu, "Facial expression recognition using emotion avatar image". 2011 IEEE International Conference.
- [7] Leh Luoh, Chih-Chang Huang, Hsueh-Yen Liu, "Image processing based emotion recognition". 2010 International Conference.
- [8] Jiequan Li, M. Oussalah, "Automatic face emotion recognition system". 2010 IEEE 9th International Conference.