IOSR Journal of Engineering (IOSRJEN) **www.iosrjen.org**
ISSN (e): 2250-3021, ISSN (p): 2278-8719
Volume 13, PP 63-69

Effective Music Player Integrated On User's Mood

Rohit Kadam[1], Darshan Gosavi[2], Chaitanya Sankhe[3], Amruta Mhatre[4]
[1,2,3](Student, Computer Engineering, Atharva College/ Mumbai University, India)
[4](Assistant Professor, Computer Engineering, Atharva College/ Mumbai University, India)

Abstract: *Conventional method of playing music depending upon the mood of a person requires human interaction. To achieve this goal, an algorithm is used to classify the human expressions and play a music track as 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. An inbuilt camera is used to capture the facial expressions of a person which reduces the designing cost of the system as compared to other methods.*

I. Introduction

Need:

Generally people have a large number of songs in their databases. Most of the music lover users find themselves in a hectic situation when they do not find songs according to their mood in the situation. The songs that the user wants to listen frequently might not be given priority or might be left out from the playlist. So we have proposed a system known as an emotion based music player which plays songs automatically by recognising the user's mood by capturing a real time image.

Basic Concept:

Emotion based music player sorts out a person's playlist based on the predetermined emotion of the user. There are two main parts of the program; determining the emotion of the user using a camera and then sorting out the current playlist based on that emotion. The application is developed in such a way that it can analyse the image properties and determine the mood of the user.

II. Literature Survey

Sr. No.	Reference paper name	Proposed System
1.	Hafeez Kabani, Sharik Khan, Omar Khan, Shabana Tadvi, Emotion Based Music Player.	Involves three major modules: Emotion extraction module, Audio feature extraction module and an Emotion-Audio recognition module. Images were converted into binary image format and face was detected using Viola-Jones algorithm whose Frontal Cart property was used. In audio extraction module, audio was converted using Audacity technique. Features like rhythm toning, pitch, centroid, spectral flux were extracted using various tools.
2.	Nikhil Zaware, Tejas Rajgure, Amey Bhadang, D. D. Sapkal, Emotion Based Music Player.	Image was captured after every decided interval of time. Images were converted from RGB format to binary format. Used OpenCV, Facial Detection using Haar Cascade. Had various face extracting processes like Extracting effective features, Feature point detection, Lip feature detection, Eye feature detection. Music player was developed in java language which had options of playing, pausing, forwarding, rewinding the song and also had the facility to add new songs, delete songs from playlist.
3.	Rahul Hirve, Shrigurudev Jagdale, Rushabh Banthia, Hilesh Kalal & K.R. Pathak, Emo Player: An Emotion Based Music Player.	This system had various modules involved like Input Image, Testing Image, Face Detection, Landmark Point Extraction, Training Data, Training of SVM & Trained SVM and Music Player. Image was captured using webcam. Training image was done by using JAFFE database. Face detection was carried out using Viola-Jones algorithm. In landmark point detection, 68 landmark points were detected and provided to SVM for training and testing. Data to be trained was then given to Trained SVM. Music player was created using python in which wxpython was used to create the GUI.

4.	Anukriti Dureha "An accurate algorithm for generating a music playlist based on facial expressions".	In this paper, the proposed algorithm revolves around an automated music recommendation system that generates a subset of the original playlist or a customized playlist in accordance with a user's facial expressions. It is composed of three main modules: Facial expression recognition module, Audio emotion recognition module and a System integration module. Facial expression recognition and audio emotion recognition modules are two mutually exclusive modules. The system integration module maps the two subspaces by constructing and querying a meta-data file. Implementation and experimentation in this paper was carried out using MATLAB. Testing was first carried out using Cohn- Kanade dataset and then to achieve real time performance, self-annotated dataset was used.
5.	Harshala Chaudhari, Amrapali Waghmare, Reshma Ganjewar, Dr. Abhijit Banubakode, A Media Player which operates depending on Human Emotions.	The proposed system consists of an interface to determine the human gestures including the facial emotions. They also provided a media player that can be controlled by the human gestures. They referred to textured face. Face was captured by webcam and it was detected by Viola-Jones algorithm. Then, using an edge detection the unwanted texture details were eliminated. The algorithm used for edge detection was Canny Edge Detection. As the algorithm uses double thresholding, edges stronger than a certain value (threshold) were selected. After this, they performed edge tracking by Hysteresis. The image size used by the system was 60x60, thus image resizing was required.
6.	Prof. Jayshree Jha, Akshay Mangaonkar, Deep Mistry, Nipun Jambaulikar, Prathamesh Kolhatkar, Facial Expression Based Music Player.	The songs were segregated into different playlists based on the feature extraction process. Viola-Jones face detection algorithm was used for face detection implemented on OpenCV. Android studio was used for the preparation of android application. Facial expressions were extracted using JavaCV library. Songs were pre-processed using audacity technique.
7.	Sayali Chavan, Ekta malkan, Dipali Bhatt, Prakash Paranjape, "XBeats-An emotion based music player".	In this system, if the user does not like the recommendation, he/she can decline the recommendation and select the desired music himself/herself. Face detection was performed using Viola-Jones face detection algorithm. Feature extraction was done by an appearance based method wiz. The Gabor-wavelet method. Gabor-wavelet appearance features were demonstrated to be more effective than geometric features. Two facial expression databases are to be used. First one is the FG-NET Facial Expression and Emotion Database which consists of MPEG video files with spontaneous emotions recorded. The system used Support Vector Machine (SVM) with Radial based Kernel function as a classifier.

III. Existing System

There are various systems proposed to match the mood of the user and classify the songs. One of the system allows user to manually enter the mood and genre that wants to be heard and then the software recommends the songs list. There is also a system in which user selects his mood manually by selecting the moods from the list and the application plays music from YouTube. In one of the system, user has to classify the songs into various emotions and then for playing the songs has to manually select a particular emotion. There are also applications in which a user can listen to the desired song online i.e. on the internet.

IV. Problem Statement

Music listeners have tough time in creating and segregating the playlist manually when they have hundreds of songs. It is also difficult to keep track of all the songs. Sometimes songs that are added are never used, thus occupying the memory space, which wastes the memory and forcing the user to find and delete song manually. Users have to manually select songs every time based on interest and mood. The user also has difficulty to reorganize and playing music when the play style varies. Currently in existing application, music is organized using playlist, and playlist songs cannot be modified or altered in one click. Users have to manually change or update each song in their playlist every time. The sequence of songs in the playlist might not be the same every time, and songs that the user wants to listen frequently might not be given priority or might be left out from the list. Currently, there are no applications that allow users to play songs on-the-go without selecting songs manually or from the playlist. Thus it becomes quite frustrating when the user doesn't get the particular song immediately which he or she is looking for. Thus, it would be very helpful if the music player itself selects a song according to the current mood the user.

V. Proposed System

This part covers design of the system, including an overview of the architecture and descriptions of the key components. The system consists of two major sections: Image analysis and music file analysis. The program heavily focuses on image analysis using various training samples to train and predict data. The working is based on different mechanisms carrying out their function in a predefined order to get the desired output. The working can be stated as follows:

1. The user camera is invoked with proper permissions after the user opens up the software and a real time graphical input (image) is provided to the system.
2. The system first checks for the presence of a face in the input using the face detection process viz. the Viola Jones face detection algorithm and then classifies the input and generates an output which is an emotion (mood) based on the expression extracted from the real time graphical input.
3. After this the classified expression acts as an input and is used to select an appropriate playlist from the initially created playlists and the songs from the playlists are played automatically.

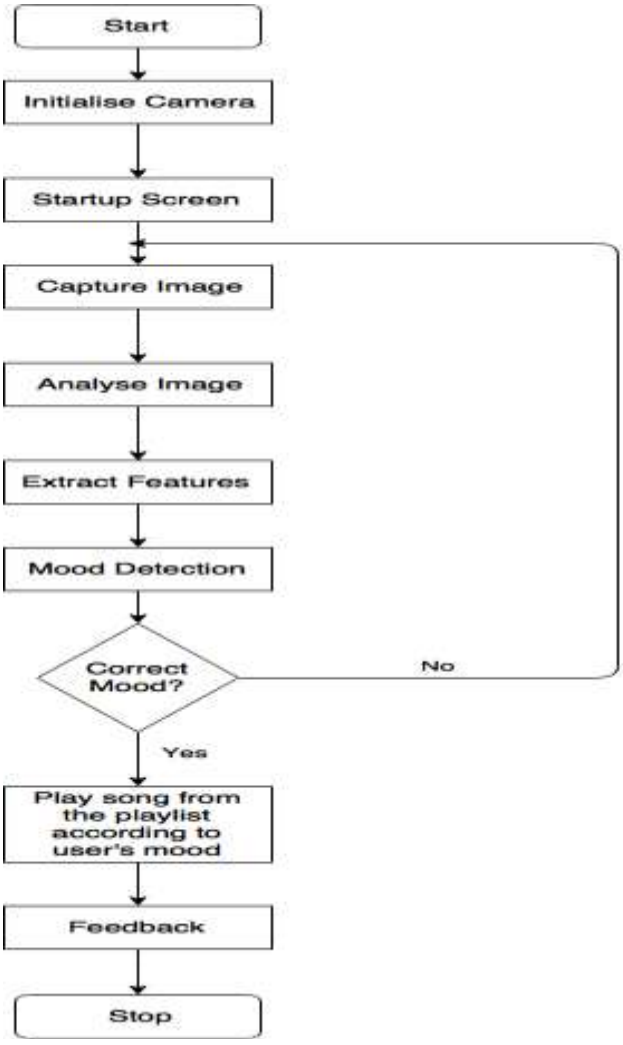


Fig. 4.1: Control flow diagram

VI. Viola Jones Face Detection Algorithm And Trained Support Vector Machine (SVM).

The algorithm has four stages:

I. Haar Feature Selection
II. Creating an Integral Image
III. Adaboost Training
IV. Cascading Classifiers

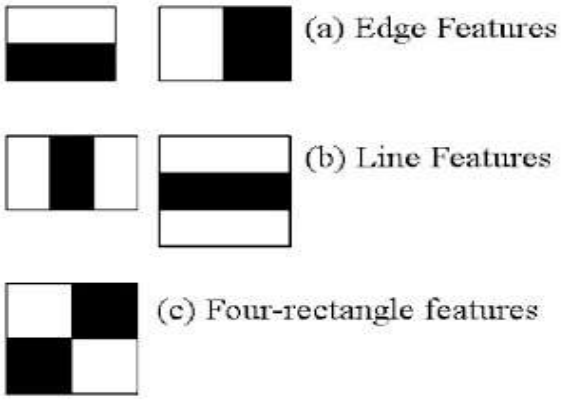
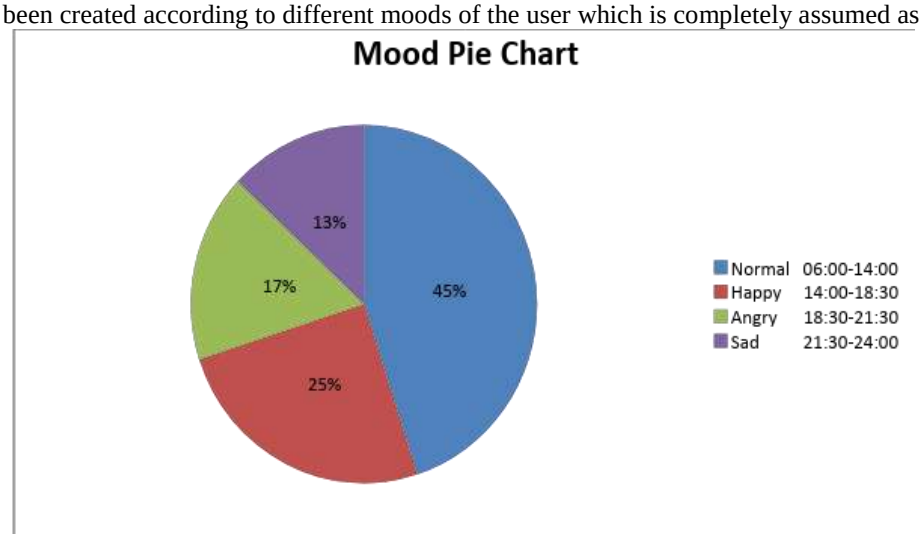


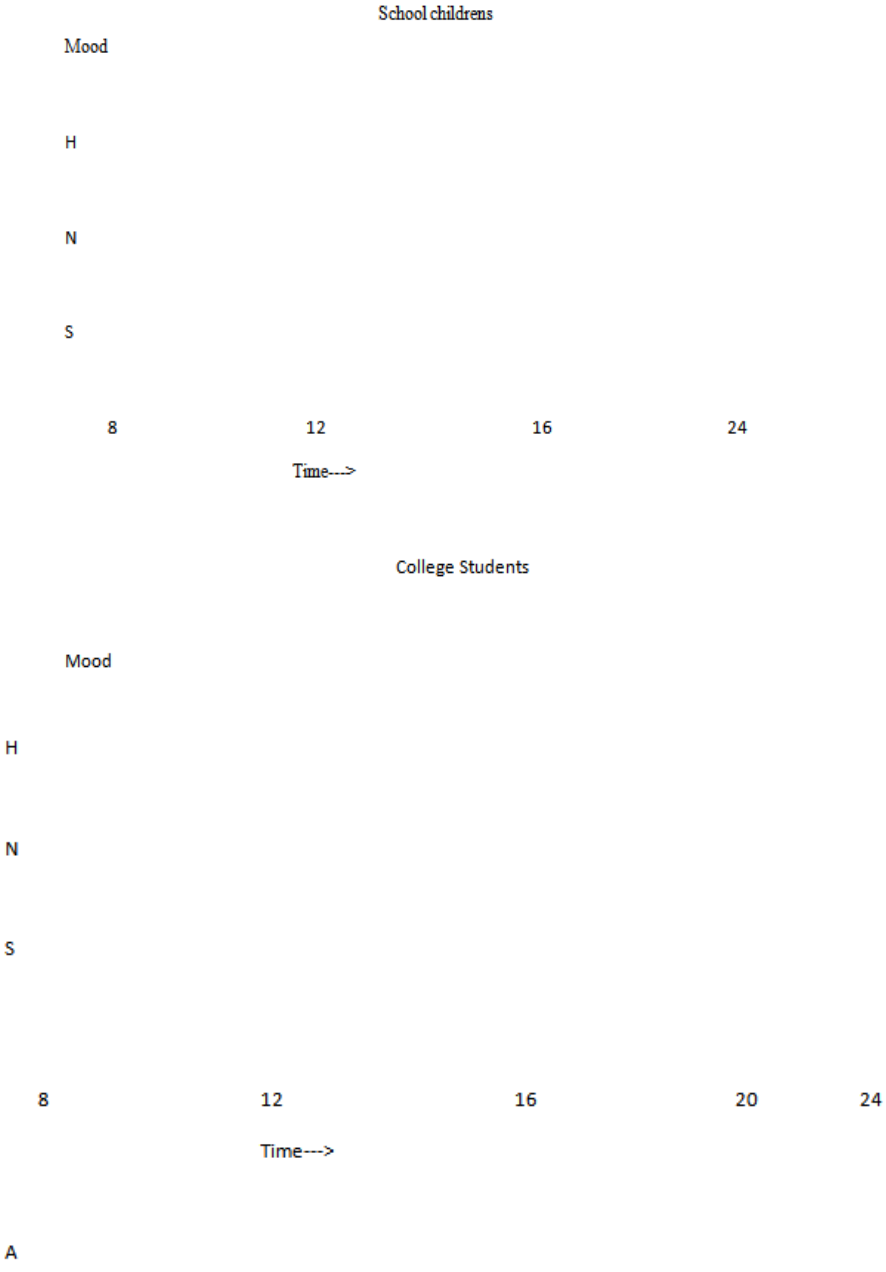
Fig.1. Common Haar Features

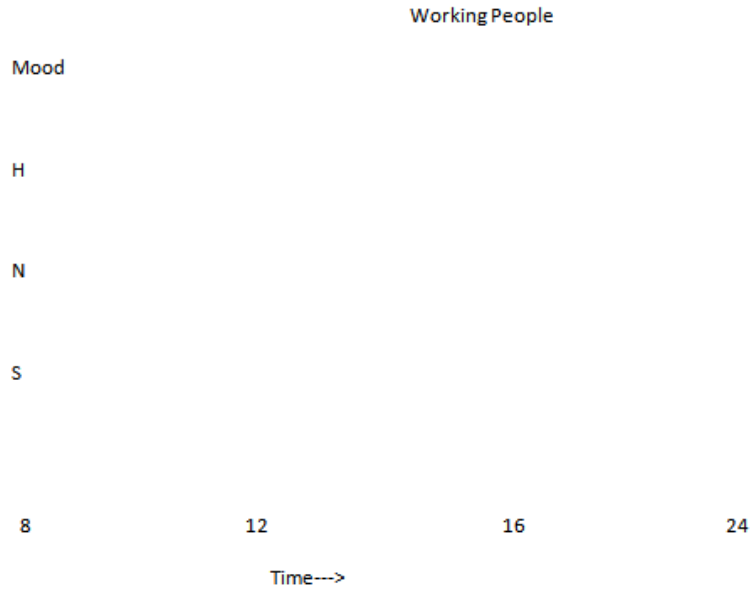
Trained SVM stands for trained Support Vector Machine. It is a machine learning technique in which we train the machine to identify the emotion of the image captured. The input to this module is from the Viola-Jones algorithm which detects the face and forwards it to the SVM. The SVM has been assigned weights to different emotion categories. The emotion closest to the weight is detected and the output is given to the audio module which plays the respective song according to the mood automatically.

Expected result:
Pie chart has been created according to different moods of the user which is completely assumed as below:



Various waveforms are plotted with mood on y-axis and time on x-axis. Time has been plotted from 8 am in the morning to 12 am i.e. till night in intervals of 4 hours. 4 moods are considered here wiz. normal, happy, sad and angry. Normal, happy and sad are plotted on positive y-axis whereas angry mood is plotted on negative y-axis. 3 categories are considered for the plotting of waveforms which are school children, college children and working people. The plotting of moods are completely assumed and are approximate.


School childrens
Mood
H
N
S
8
12
16
24
Time--->
College Students
Mood
H
N
S
8
12
16
20
24
Time--->
A



VII. Future Scope And Applications

The project is technically feasible as it uses a user friendly platform of android studio and OpenCV where java and python languages will be implemented.

Here, we use the secondary camera of mobile phone which reduces the cost of project.

There is no need to buy any expensive software for this project and hence it is profitable both for developer and the user.

Emotion Based Music player is a useful application for music listeners with a smartphone and an Internet connection. The application is designed to meet the following needs of the users as described below:

1. Adding songs
2. Removing songs
3. Updating songs
6. Capturing emotion using camera.

The future scope in the system would be to design a mechanism that would be helpful in music therapy treatment and provide the music.

Patients suffering from disorders like mental stress, anxiety, acute depression and trauma can be treated.

The proposed system also tends to avoid in future the unpredictable results produced in extreme bad light conditions and very poor camera resolution.

Applications:

I. Music therapists use music to enhance social or interpersonal, affective and behavioural functioning. Music therapy reduces muscle tension and anxiety.

II. Psychologists can use music to treat anxiety, stress, depression, etc as music has proved to reduce these health affecting problems.

III. The mood detection algorithm we are using can be used in smartphones social media apps for applying face filters according to the mood.

IV. The mood detection with music if mastered for all moods can be applied in machine learning fields to show what other people listened to the most during that mood. The mood detection can be extended for blogs, books, nearby places to visit, according to the mood if the database is available.

VIII. Conclusion

Thus the application developed will reduce the efforts of user in creating and managing playlist. It will provide better enjoyment to the music listeners by providing the most suitable or appropriate song to the user according to his/her current mood. It will not only help user but also the songs are systematically sorted.

The system thus aims at providing the users with a cheaper, additional hardware free and accurate emotion based music system. It is of great use for music lovers based on their mood and emotional behaviour. It

will help reduce the searching time for music thereby reducing the unnecessary computational time and thereby increasing the overall accuracy and efficiency of the system.

The Emotion-Based Music Player is used to automate and give a better music player experience for the end user. The application solves the basic needs of music listeners without troubling them as existing applications do i.e it uses technology to increase the interaction of the system with the user in many ways. It eases the work of the end-user by capturing the image using a camera, determining their emotion, and suggesting a customized playlist through a more advanced and interactive system. This system will be of great use in future for psychologists under musical therapized treatments as music has been proved to reduce stress, depression, anxiety, and many more day-to-day problems.

Acknowledgement

It gives us great pleasure in presenting this project synopsis report titled:"Emotion Based Music Player". We express our gratitude to our project guide Prof. Amruta Mhatre, who provided us with all the guidance and encouragement and making the lab available to us at any time. We also would like to deeply express our sincere gratitude to Project coordinators. We are eager and glad to express our gratitude to the Head of the Computer Science Dept. Prof. Mahendra Patil, for his approval of this project. We are also thankful to him for providing us the needed assistance, detailed suggestions and also encouragement to do the project. We would like to deeply express our sincere gratitude to our respected principal Prof. Dr. Shrikant Kallurkar and the management of Atharva College of Engineering for providing such an ideal atmosphere to build up this project with well-equipped library with all the utmost necessary reference materials and up to date CMPN Laboratories. We are extremely thankful to all staff and the management of the college for providing us all the facilities and resources required.

References

Journal Papers:

[1] Hafeez Kabani, Sharik Khan, Omar Khan, Shabana Tadvi, Emotion Based Music Player, *International Journal of Engineering Research and General Science Volume 3, Issue 1 ISSN 2091-2730,* January, 2015.

[2] Nikhil Zaware, Tejas Rajgure, Amey Bhadang, D. D. Sapkal, Emotion Based Music Player, *International Journal of Innovative research and development Volume 3, Issue ISSN 2278 0211 (Online),* January-February, 2015.

[3] Rahul Hirve, Shrigurudev Jagdale, Rushabh Banthia, Hilesh Kalal& K.R. Pathak**,** *Imperial Journal of Interdisciplinary Research (IJIR) Vol-2, Issue-5,* 2016, Emo Player: An Emotion Based Music Player

[4] Anukriti Dureha "An accurate algorithm for generating a music playlist based on facial expressions" *International Journal of Computer Applications, Volume 100-No.9,* 2014.

[5] Harshala Chaudhari, Amrapali Waghmare, Reshma Ganjewar, Dr. Abhijit Banubakode, *International Journal of Advanced Research in Computer and Communication Engineering Vol. 4, Issue 10,* May 2015, A Media Player which operates depending on Human Emotions

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

[7] Sayali Chavan, Ekta Malkan, Dipali Bhatt, Prakash H. Paranjape, "XBeats-An Emotion Based Music Player"*International journal for advance research in engineering and technology, Volume 2, Issue 1, ISSN 2320-6802,* January 2014.