FACIAL EMOTION DETECTOR AND MUSIC PLAYER SYSTEM

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Abstract:- *Human emotions play an essential role in what's going on in one's life. Humans oftenly use their emotions to express their feelings to each other. We also have hand gestures and tone of voice as the representative to explain one's feelings. Some humans tend to change the mood of other people by using their unique ways. Humans are an endless advanced version of machines who have the best prediction level with highest power of accuracy. Human expressions are a mandatory task in determining the current mood of an individual. They read the curve of the smile, eyes, cheeks or even forehead. When sad or angry, people tend to speak their heart out to their friends or close one or maybe listen to music. Music is a flair that calms human anatomy and brain. Taking these two ingredients and mixing them together, our project deals with predicting the emotion of an individual through facial expressions and playing music according to an individual mood that will eventually calm the mood of the person. Our project also offers an individual to play songs according to his current mood or for the betterment of mood.*

KeyWords: Human emotions, Expressions, Music, Mood, Betterment.

1. Introduction

Human face is the most important organ of an individual body. And, through that people express and recognize emotions of each other in the communicating system. Human happiness completes the art of living and Music plays one of the vital roles in keeping an individual with a peace of mind and at ease. Music always turns out to be a stress and tensity reliever. It has always been a boon to an individual and its mindset. With advancement of technology, manual work tends to be in last line and automation has gained a lot of attention. Our system aims to predict the emotion of an individual which will be along with giving input by the end user in which the end user will be asked whether they want to listen to songs according to their current mood or for the betterment of their mood which will be followed by playing songs over YouTube. Our pure system takes the consideration of the respective individual mood i.e. Happy, Sad, Angry, Neutral, or Surprise. This intelligent system proposes an intelligent agent that categorizes all sorts of emotions as a different music collection which will eventually play songs and recommends an appropriate playlist to the user according to their mood or choice for betterment of the mood.

1.1 Related Work and Literature Survey

We came across many applications that serve solutions and assistance for music playlist creation, playing & pausing a particular song and recommendation. To provide the facility and the solutions, numerous techniques and approaches have been followed, approached and developed to determine the current state of emotion and playing music according to it. The proposed systems have only focused on playing or recommending songs according to the mood.

Sr. No.	Research Paper/ Patent	Title	Author	Description
1.	Research Paper	EMOTION BASED MUSIC RECOMMENDATION SYSTEM	H. Immanuel James, J. James Anto Arnold, J. Maria Masilla Ruban, M. Tamilarasan, R. Saranya	The research paper describes the proposed system that explains the features and facial expressions to detect emotions which will generate the music based on emotions.
2.	Research Paper	EMOTION BASED MUSIC	Dhruvisha Bansal,	The research paper

		PLAYING DEVICE	Pinkal Bhatt , Megha Dusane , Avneet Saluja, Kushal Patel	describes the neoteric approach that helps the user to play the song automatically according to the emotions of the user.
3.	Research Paper	Mood Based Music Player Using Real Time Facial Expression Extraction	Shreya Zunjarrao, Poonam Harane, Mr.Akshay Choudhary	The main objective of this proposed system is to scan the face, track the facial features to determine end user emotion and based on it gives an individualized playlist.
4.	Research Paper	MoodSound: A Emotion based Music Player	Mayank vyas	The research paper describes the proposed system by implementing real time facial expressions which will sort the music list according to the mood. And, the system will play the respective songs in the list to improve the user's mood.
5.	Research Paper	Emotional Detection and Music Recommendation System based on User Facial Expression	S Metilda Florence and M Uma	The research paper describes the proposed system that detects Human's emotion using facial expressions and recommends music to the end user.
6.	Research Paper	A Novel Method To DesignEmotion-Based-Music-Player	Mr.T.M.Hayath, Ms.Sulthana, Mr.Kampli	The research paper describes the proposed system that captures the image of the user, determine their emotions and suggest a customized playlist through their advance system
7.	Patent	GENERATING MUSIC PLAYLIST BASED ON FACIAL EXPRESSION	Markus Mans Folke Andreasson	This patent describes how to capture image emotion by detection and storing a playlist assigned to a particular mood of an individual.
8.	Patent	FACIAL EMOTION RECOGNITION		This patent describes the disclosure that provides an automatic geometric method for

				analyzing, extracting and recognizing human facial expressions using neural network then using genetic and back propagation algorithm for detecting emotion.

1.2 Existing System

In an old school of music player, the user face is detected via a prediction system which will be followed by browsing songs manually through the playlist and choosing songs according to the mood whether current state of mood or for betterment of mood. The emotion predicting system developed takes quite a minute in recognizing the emotion of the user in existing systems. In today's world, with all the increasing furtherance and development in the field of multimedia, technology and automation, several music media players have been developed with various features. But the challenge users have to face is to manually select and play the song from the recommended playlist which was suggested by such existing systems. The existing system provides their own built media player which has various features such as playing, pausing, shuffling of songs and many more. Some advanced features such as fast forwarding, reverse, variable playback speed, constantly same songs, playing of random songs but these features are not being provided in the media player where user face as input is detected and emotion is recognized; These features are being provided in mobile apps such as, Wynk music, Gaana, Hungama, etc. These mobile apps do not provide the functionality of recognizing human emotions. Therefore, User craves for minimum clicks and everything to be done automatically with all the advanced features.

1.3 Proposed System

1.3.1 Facial Detection:

An efficient and systematic object detection method is to use the Haar feature based cascading classifier. It is an effective machine learning approach in which cascade function is trained using the datasets of negative and positive images. It is an algorithm which is used to identify the faces in a real time video, real time camera or an image. The MTCNN algorithm uses edges or line detection features to detect the user's face.

1.3.2 Feature-Point Detection

The feature points from the input are recognized automatically when the face is inputted via camera. There is conversion of RGB format image into binary format image for face detection followed by black pixel which is used as a replacement if average value of the pixel is obtained less than 110 or else a white pixel is used.

1.3.3 Emotion Recognition

Emotion Detection Recognition (EDR) is a method used for detection and recognition of human emotions which uses three parts for mood detection i.e. Face location, feature extraction, emotion classification. We are using 5 moods i.e. Happy, Sad, Surprise, Angry and Neutral.

1.3.4 Prediction and Feature Extraction

To predict the current state of emotion of the user, we are using different feature extractions as shown below in *figure1.1*.

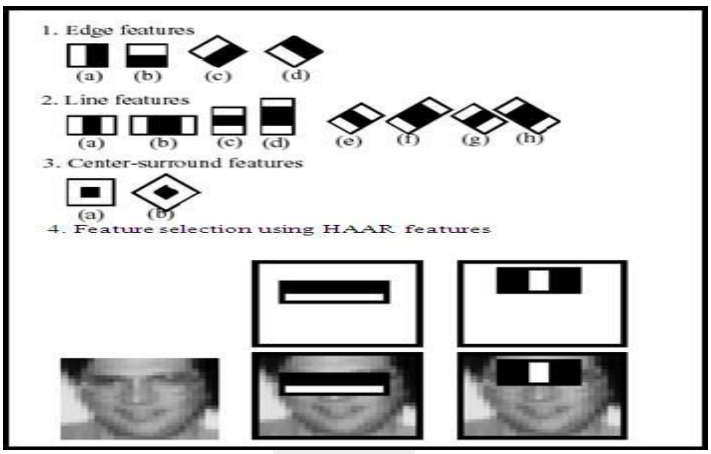


Figure 1.1

1.3.5 Playing Songs

After prediction of the current mood, there is a string showing about the current state of the mood of the user. Instead of directly directing the user on songs, the user will be asked if they want to listen to songs according to their mood or for the betterment of the mood. The wise choice of the mood with just a click will redirect him on YouTube. As with the advance development of technology and automation, a user craves for all the advanced features in one dish, so what's better than YouTube as a song player. We are simply using YouTube as a music media player which has all the advanced technology. As soon as the user gives input of his choice, the playlist will get played on YouTube according to the user's choice. Here, Playlist is a representative of the database.

1.4 System Architecture

Image processing and facial detection are playing two major roles in this proposed system. The proposed system will capture the image of the user using a webcam when the 'Detect' button is clicked which will be followed by playing songs either of the current mood or for the betterment of the mood.

Following *figure1.2* is the architectural design of the proposed system:

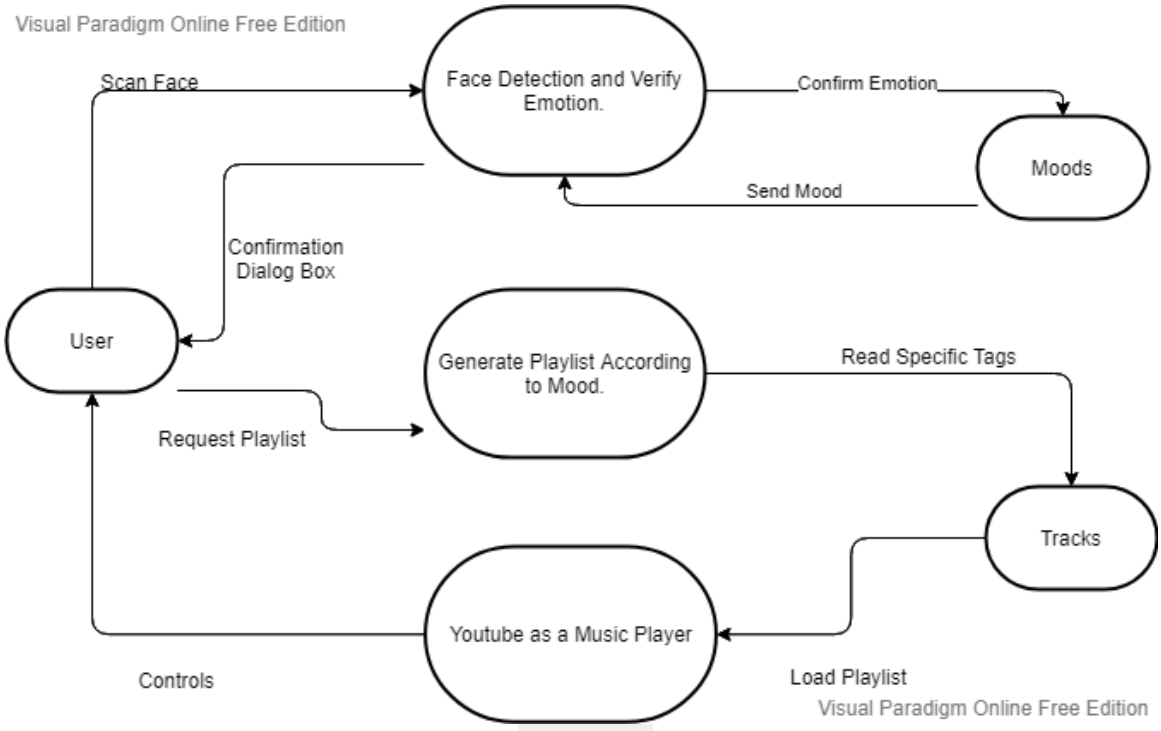


Figure 1.2

1.5 Use Case diagram

Following is the use case diagram in *figure 1.3*:

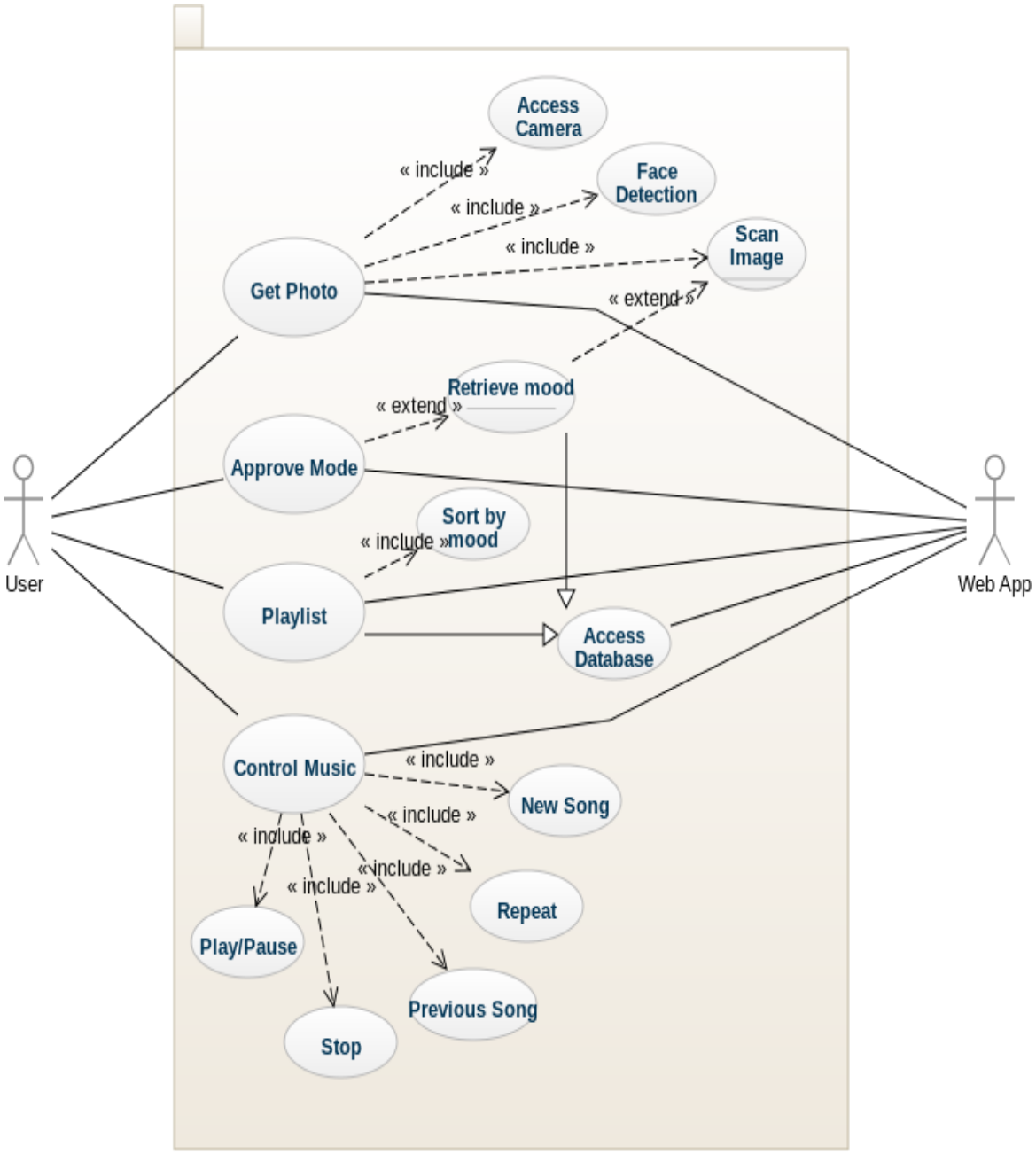


Figure 1.3

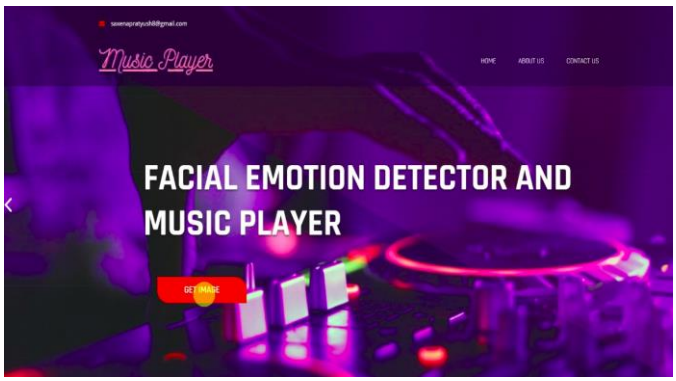
1.6 Emotions Used

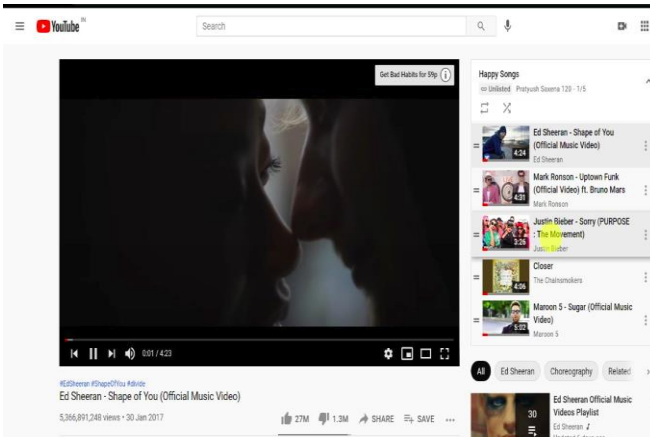
- Happy
- Sad
- Angry
- Surprised
- Neutral

Angry *Happy* *Sad* *Neutral* *Surprised*

2. Results and Discussion

This proposed study proposes a Human face emotion and song playing either according to the current mood or for the betterment or calming mood of the user. Human face images are captured with the help of a camera. Once the picture has been taken, the captured frame of the image is then converted into a gray scale image to improve the performance of the classifier which will be followed by sending the converted image to the classifier algorithm where individual features are extracted from the face. Several performing the function will help the classifier to get trained even better. The respective emotion gets detected and recognized with the help of patterns and then making wise decisions will help the user to get his mood better.





3. Conclusion:

This proposed system is developed with the help of a Machine learning module in PythonScript. We have used OpenCv, Tensorflow, Keras, WebBrowser and of course Python Scripting to develop this automated system. This system has actually been prepared for the ease of end users and simplifying one's life. This will eventually calm the person and appreciate their wise choice that will help him to improve their mood. The songs will be played on YouTube along with a particular emotion playlist and using its advanced feature, one can listen to songs happily after.

References:

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