



FACIAL EXPRESSION BASED MUSIC PLAYER

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Abstract: Human face plays an important role in extraction of an individual's behavior. Through human expressions the other person can know the current state of person. To calm down some of the moods like fear, angry music is the best therapy. But it is very time consuming and difficult to manage large playlists and to select the songs from these playlists. Thus, it would be very helpful if there is a model which plays the music according to person's mood. Facial expressions are given to inbuilt camera. The image is captured using camera and that image is passed under different stages to detect the mood or emotion of a user. HarCascade, OpenCV algorithms were used for detecting the face. so, a model is developed by using fisher face, keras which maps the emotion with the images. According to this expression captured, music is played from a database. And model will display the expression which is captured with respect to song is played from a database.

Keywords: HarCascade, OpenCV, Keras

I. INTRODUCTION

Artificial intelligence, an extensive, prominent and imperative domain that has attracted a lot of researchers and programs in recent times. This particular domain has taken over the world in very short notice. One of the most prominent powers of artificial intelligence is face recognition techniques. There are many existing systems that could recognize facial emotions. On the other hand, there are systems that recommend music. Deep learning-based facial expression recognition is one of these methods to detect emotion state (e.g., anger, fear, neutral, happiness, disgust, sadness and surprise) of human. This method aims to detect facial expressions automatically to identify the emotional state with high accuracy. According to the emotions detected, songs will be played from the dataset which is created manually.

II. RESEARCH METHODOLOGY

Human face is one of the most important parts of the human body. It plays a great role in knowing the emotional status or the mood of the person. The mood of the person can be predicted, up to a certain accuracy, with the help of certain features visible on the face. The images are stored in database. From the database images are trained by using keras to recognize the faces. Fisher Face algorithm is used for classify the images from the database and map it with its emotion. It is mostly used for the observing data and from that by some probabilistic calculation generate models. The flow of Fisher face is like it takes classified images then it will reduce the dimension of the data and by calculating its statistical value according to the given categories it stores numeric values in .xml file. While prediction it also calculates the same for given image and compare the value with the computed dataset values and give according result with confidence value. The size what we get from real time scan is not always same as data (very less difference) so, We resize the image to extract the model data size. In our case we have chosen 350*350. In this method, we have implemented the cropping of image by given parameters of haarcascade by clahe_image and use of cv2's method. Haarcascade model is precise face detection trained model which is provided by Open-cv. It returns the co-ordinates in terms of (x, y) at (left, bottom) of face frame and its width and height from those co-ordinates. Song is added to model by linking of python with JavaScript through eel library. Which provide the privilege to access python methods from js as well as vice versa. The music will be played from the queue of the dataset and according to the result emotion's emoji is displayed on the output window.

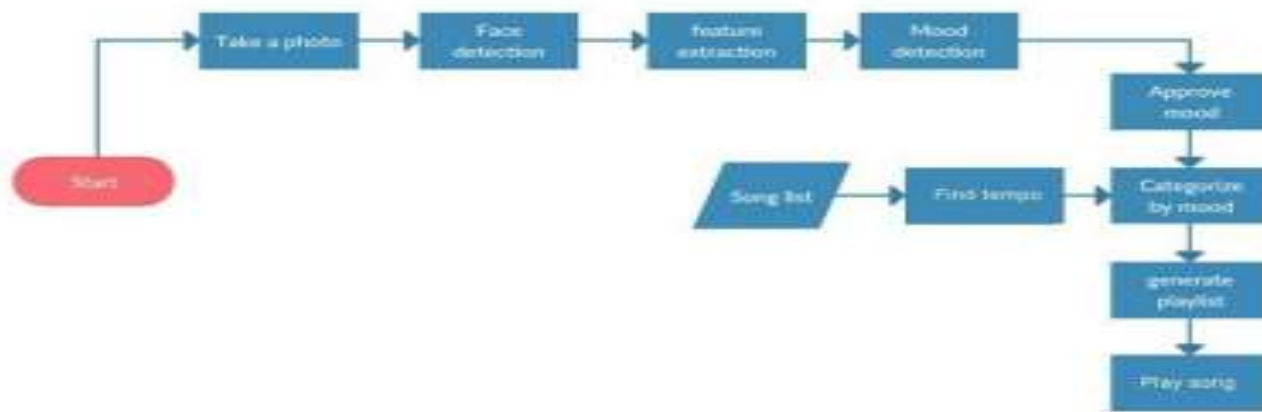


Figure 1: Workflow of model

III. RESULTS AND DISCUSSION

The model is not stucked on one image for testing, While the code will run it will take around 2-3 images in a short time (1-2 sec) and for all those images it will compute result and according to the average value of that it will give result. And in the output window the music respected to the expression is played and the emoji respected to the expression is displayed in the output window. And in the recognized expression in the form of text is displayed.

Results of Descriptive Statics of Study Variables

Table 1: Descriptive Statics

EMOTIONS	ACCURACY
Happy	98%
Neutral	96%
Sad	80%
Angry	95%

Figure 2: Descriptive Statics

Table 2: Time comparison for different modules

MODULE	TIME TAKEN (sec)
Face detection	3 sec
Facial Feature Extraction	2 sec
Connecting face detection to music	0.9 sec
Displaying the emoji	0.8 sec

Figure 3: Time comparison for different modules

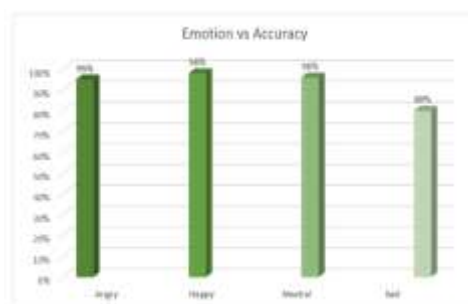


Figure 4: Graph

In table 1, the emotions with accuracy is given, where if the expression given to webcam is happy then the model detecting it with 98% accuracy. And for the neutral the accuracy is 96%. And for the sad the detection accuracy is bit low. As the model sometimes fail to detect the sad expression and unsteadying of detecting it as sad it will detect it as neutral. And this can be corrected using training the detection model with adding some function to the implemented algorithm. And the model is detecting the expression as angry with 95% accuracy.

In table 2, the face detection model takes 3 second to load the face detection module and the feature extraction module will load in 2 seconds. And for connecting the music to face detection it will take 0.9 seconds. And the for the given expression respected emoji is displayed by taking 0.8 seconds.

IV.CONCLUSION

The model is using fisher face for training the image to map it with emotions and Har cascade to detection of the face which is giving 80% accuracy. And the as the output music is played with respected to recognized expression by displaying the emoji of inputted expression from the camera.

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