International Journal of Advance Research in Science and Engineering
Volume No.07, Issue No.04, April 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

Emotion Recognition and Reaction using Neural Networks and Raspberry Pi 3

Anish Pimple[1], Prathamesh Shinde[2], Aaditya Paradkar[3], Mohit Mhashilkar[4], Sneha Sankhe[5]

Information Technology Department, Theem College of Engineering, Boisar (India) [1, 2,3,4,5]

ABSTRACT

In present day technology human-machine Interaction is growing in demand and machine needs to understand human gestures and emotions. If a machine can identify human emotions, it can understand human behavior better, thus improving the task efficiency. Emotions can be understood by text, vocal, verbal and facial expressions. Facial expression play vital in judging emotions of a person. We know that limited amount of work is done in field of real time emotion recognition using facial images. In this project, we propose that these emotions can be used for enhancing the mood by implementing Music as per mood application.

In our project have classified seven emotions: anger, disgust, happiness, fear, sad, neutral and surprise. Sad emotion can be further classified into levels of sadness, the highest of which falls under depression. Depression is a disorder associated with reduced social functioning, impaired quality of life, and increased chances of death. Music therapy has been used in the treatment of a variety of mental disorders such as depression, personality disorder, anxiety, and bipolar disorder. The novelty of our proposed method lies in the implementation of emotion recognition at real time and an average accuracy achieved is pretty good at real time. The device can recognize emotions dynamically in real time under social environments where emotion recognition plays a major role. This device can be used to identify sadness of a person which will recognize depression levels and the device can react to it by playing anti-depressing music.

Keywords:*Emotion recognition, mapping, music, emotion reaction.*

1. INTRODUCTION

Human emotions play an important role in the interpersonal relationships. The automatic recognition of emotions has been an active research topic from early eras. Emotions can be extracted from speech, hand and gestures of the body and through facial expressions. Hence extracting and understanding of emotion has a high importance of the interaction between human and machine communication.

1.1. Objective

- Recognizing the accurate emotion and playing music as per mood.
- All the manual work required to search the suitable song from the music library is reduced.
- Mapping of music based on the genre of music.

- To make the system user friendly and easy to understand.

2. WORKING

Emotion Recognition: The user's facial image is captured from a camera module or it can be taken from the stored database. This image goes through some enhancement processes such as tone mapping to restore the initial or original contrast of the image. After enhancing the images all of them are converted into binary image format so that the face is detected using the Viola- Jones algorithm where the maximum threshold value is set between16-20. The output of this algorithm Face detection block forms an input to the facial feature extraction block. To improve accuracy and a target to acquire real time performance only features of eyes and mouth are obtained enough to depict the emotions correctly. The final step of the Facial Expression Recognition system is based on machine learning; more correctly it is the classification task. The set of features which were acquired from the face region in the previous stage is the input to the classifier. Since the training set consists of labelled data, classification requires supervised training.

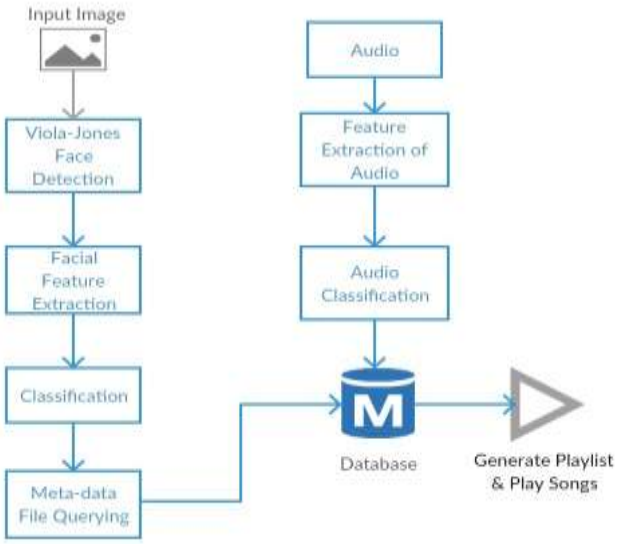

Fig 1: System Architecture

International Journal of Advance Research in Science and Engineering
Volume No.07, Issue No.04, April 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

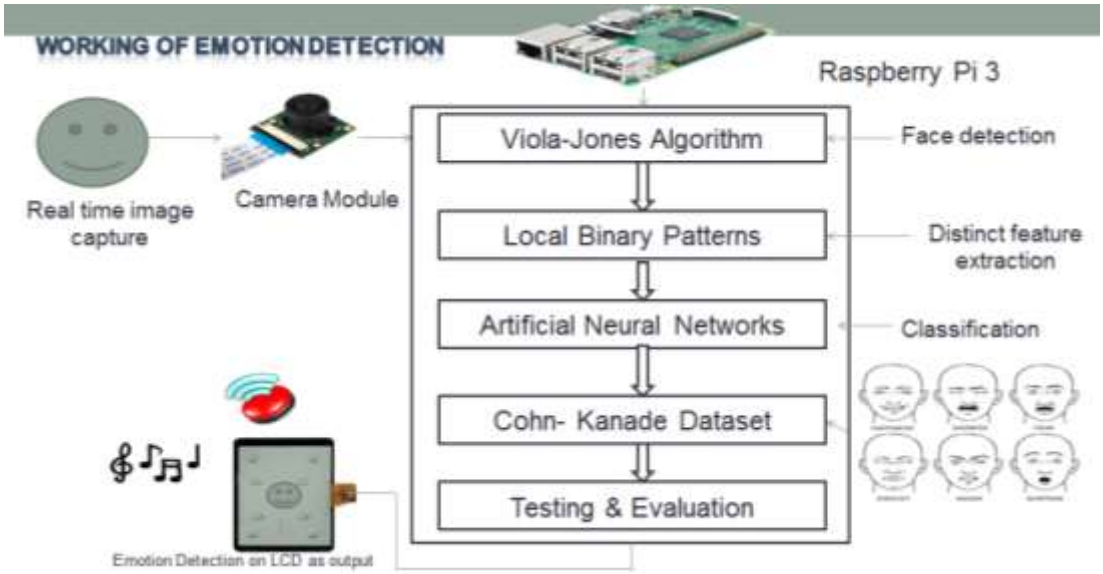

Fig 2(a): Emotion Recognition

Expression Reaction: The facial expression would be categorized into 7 different types of emotions like happy, angry, sad, surprise, disgust, surprise and neutral. The audio data is given in its specified genres such as Blues, Reggae, Instrumental, Latino, Pop, Rap, Rock, Classical, etc. Then the emotions extracted from facial features and the audio features are then mapped. The audio features include happy, angry, sad, surprise, disgust, surprise and neutral which are linked to the audio data.

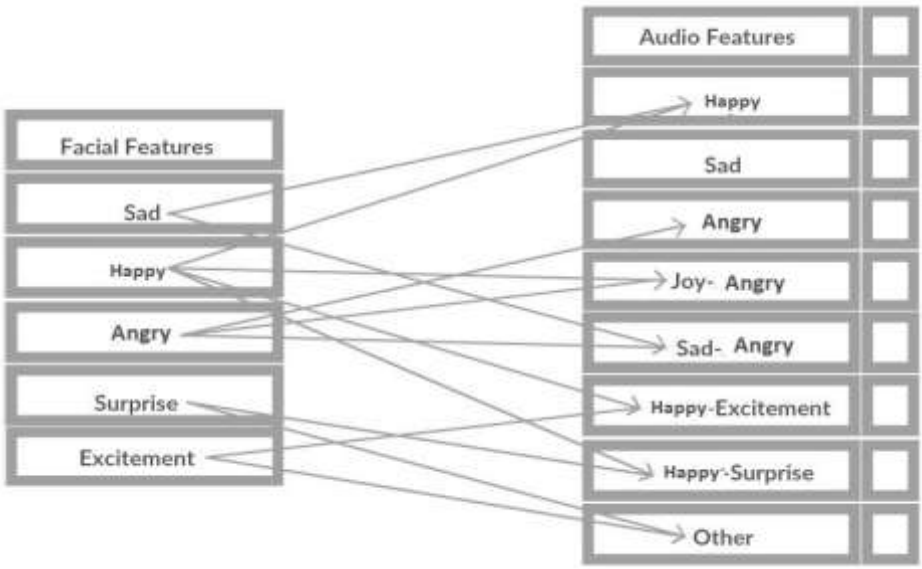

Fig 2(b): Mapping of Facial features with audio features

'Angry'	Blues, reggae, instrum, latino
'Disgust'	Blues, pop, instrum, latino
'Fear'	Blues, reggae, instrum, latino
'Happy'	Rock, classic love, rap, latino
'Sad'	Blues, rock, rap, instrum, latino
'Surprise'	Rock, pop, latino
'neutral'	Blues, rock, rap, classical love, latino

Fig 2(c): Classification of music with different Genres

3. CONCLUSION

Prior to implementing the system, one of the first challenges of the project was choosing the algorithms for each individual module, because the selection had to consider the following: integration of techniques, restriction to the time allowed for the project development, speed of computation and ultimately, achieving a good system performance.

Efforts have been made to catch human expressions of anyone. Emotions are due to any activity in brain and it is known through face, as face has maximum sense organs. Hence human facial activity is considered.

The evaluation of the project indicates that the preliminary objectives of the project have been met.

The key objectives were:

1. Implement basic feature extraction algorithms to determine their impacts on an emotion recognition system.
2. Extract information from a music file to sort and classify a music playlist based on human emotion.

3.1. ADVANTAGES

- Emotion is recognized in fraction of seconds.
- Song is played according to the emotion is recognized.
- Song with similar genre is played for particular emotion.
- No need for manually selecting song.
- System is design in such a way that anyone can use anywhere.

3.2. APPLICATION

1) Social Robot Emotion Recognition:

To improve the healthcare and wellbeing of the elderly population, a therapeutic social robot was designed and its interaction with human was investigated in this research. The focus is to enable the designed robot to understand human's emotion and express emotion through gestures accordingly.

2) Feedback system for E-Learning:

Emotions of a student during course engagement play a vital role in any learning environment whether it's in classrooms or in e-learning. We use excite, disturb and moving pattern of eyes and head to infer meaningful information to understand mood of the student while engaged in an e-learning environment.

3) The interactive TV applications enable the customer to actively give feedback on TV Program.

REFERENCES

[1] Monika Dubey, Prof. Lokesh Singh. Automatic Emotion Recognition Using Facial Expression. International Research Journal of Engineering and Technology (IRJET) Volume: 03 Issue: 02 | Feb-2016

[2] Miss. Disha Rabashette, Miss. Rhutuja Tale. International Journal of Emerging Trends in Science and Technology. Emotion Based Music System. MKSSS Cummins College of Engg. , Pune 411052 May 2016

[3] Agata Kołakowska, Agnieszka Landowska, Mariusz Szwoch, Wioleta Szwoch, Michał R. Wróbel Gdansk University of Technology, Gdańsk, Poland,Emotion Recognition and its Application in Software Engineering

[4] Dr. Tim Morris. Emotion Based Music Player The University Of Manchester The School of Computer Science.

[5] Prof. Andreea Pascu Prof. Ross King. Facial Expression Recognition System.Manchester April 2015