

AUTOMATIC FACE EMOTION RECOGNITION

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ABSTRACT:

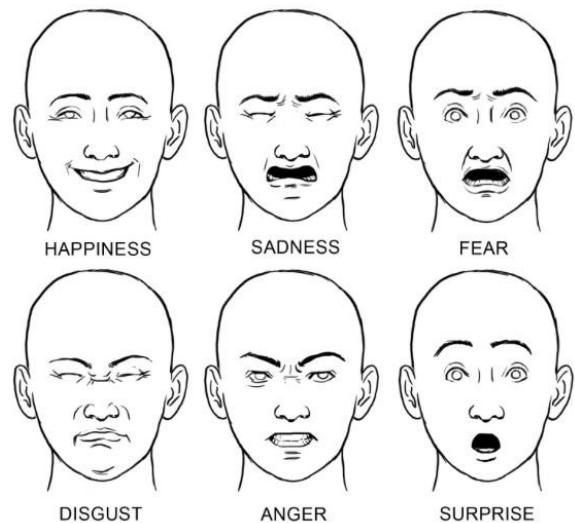
The main purpose of this talk is to give some introduction about the requirements and uses of facial expression recognition. Non-verbal form of communication is facial expression. It helps to express the human attitude and also recognize his or her mental condition. Numbers of research have been carried out over the past two decades for enhancing the human computer interaction. This paper contains the some information about facial expression recognition, application, related study of face expression recognition strategies and steps.

Keywords: Emotion recognition, Facial Recognition, Image Processing, Human Machine Interface.

I.INTRODUCTION

Emotion features have big effect on social abilities to learn, understand and think in a logical way about things such as communication, understanding human behavior and making diverse decisions. Emotion plays a crucial role in the process of communication. Voice is considered as the Verbal form of communication. Non-verbal forms of communications are facial expression action, body posture and gesture. Facial expression recognition has number of applications such as human computer interaction, social robots, alert system and animation.

1.1 **Classification of facial expression and it's aspects:** To describe human emotion facial expression plays an important role. As humans are filled with number of emotions they have the tendency to change their emotions from starting of day to end of the day. Basically six emotions are defined by the modern psychology they are happiness, sadness, anger, fear, surprise and disgust. Human emotions are recognized by the facial muscles movements. Eyebrows, mouth, nose, eyes are the basic facial features.



1.2 **Emotion Identification And Motion Of Facial Parts**

Happiness: Happiness is the one of the strongest expression by the human. Human may get cheerful, pride, pleasure and thrill.

Facial parts involved in this type of emotion are eye will be opened; opened mouth raised cheeks and pulls down lips.

Sadness: This emotion is against happiness. This emotion automatically comes during irritation, hurt or suffering by something/someone. Facial parts that involved in this type of emotion are closed eyes, lips corners are pulled down and outer eyebrows are pulled down.

Fear: This is a harmful emotion. Fear emotion occurs due to the physical or psychological harm, such as horror, stress, and nervousness. Facial parts that involved in this type of emotion are mouth will be opened, jaw dropped inner eyebrows are and outer eyebrows are pull down.

Disgust: something is not liked by human is disgust emotion which is initiated by some bad smell, bad taste and also loud sound. Facial parts that involved in this type of emotion are wrinkles around nose and upper and lower lips are depressed.

Anger: This emotion is the most harmful and danger one that's why humans are trying to ignore this emotion. Anger will be initiated due to some frustration, hate and dislike. Facial parts that involved in this type of emotion are eyes are opened, teeth's are shutdown and eyebrows are pulled down.

Surprise: when an unexpected thing happens in a human life, this emotion comes into existence, in the form of amazement, astonishment. Facial parts that involved in this type of emotion are eyes and mouth will be opened; upper eyebrows and jaw will be dropped.

II.RELATED WORKS

Bharati A et.al, in this authors explained Zernike movement that is one of the facial expression recognition systems using noise and rotation invariant based on a statistical movement. Naive Bayesian classifier takes input as the Extracted feature from Zernike movements for emotion recognition. [1]

Mateusz zarkowski et.al, authors have presented a personalized emotion recognition technique. This paper gives the main priority to classification of emotions. For facial configuration, they included two models such as active space model and active appearance models. [2]

Shuai liu et.al used the Adoost algorithm to recognize human face using SVM techniques. Emotion recognition system is based on the E-learning concepts. [3]

Kwang Ho et.al, proposed emotion detection on the members who were watching TV program. To find particular TV watcher and also to identify their internal emotional state face expression recognition techniques are employed. [4]

Monika Dubey et.al, the main aim of this paper is on exploring the necessities and applications of facial expression recognition. Here, they explained about the verbal and non-verbal form of communication. [5]

Anwasha Banerjee and D.N.Tiberewala authours proposed various emotions using EOG signals and here they used the support vector machine and Naïve Bayes (NB) algorithm for classification of emotions like positive, neutral and negative. [6]

Moon Hwan Kim et.al proposed the emotion will be detected using frontal face image and also here they involved three steps such as image processing stage, facial feature extraction stage, and emotion detection stage.[7]

Rohini Patil, C.G.Patil they worked on exploring automatic emotion recognition and classification models and also they used the genetic algorithm and neural network. Here their proposed work was tested on the face image. [8]

W.N. Widanagamaachchi & A.T. Dharmaratne worked on the emotion recognition. For the classification of universal emotion, they used the neural network combined with image processing. [9]

V.R.Gosavi and Dr. A. K. Deshmane used a new algorithm to isolate a set of images for recognition of facial emotion and the authors focused more on the computer vision techniques. [10]

III. Facial expression recognition

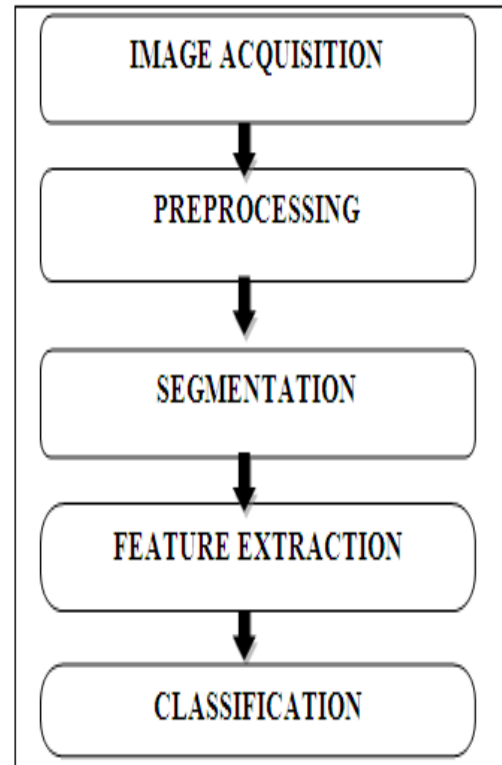


Fig 2- facial expression recognition system [5].

Figure 2 shows the facial expression recognition system.

It includes below steps:

Image acquisition: Image acquisition is the first step, where the image can be obtained. Static image or image sequence techniques are used for the face emotion recognition. The most popular image is 2D gray scale facial image and at the same time color images can give more convenient information about emotions.

Preprocessing: Preprocessing is the stage, where unwanted noise distortions will be eliminated. This stage enhances the input image and it also includes the techniques of filtering and normalization.

Segmentation: segmentation is the process in which the input image is segmented into number of sub images on the basis of their texture, edges and intensity.

Feature extraction: It is the interesting part of the image processing. The process extracts the original image and later delivers meaningful image. It reduces the image size which greatly helps in image storage process.

Classification: This stage classifies the images according to their similar characteristics. This step is also known as the feature selection stage.

IV.APPLICATION AREA

As the technologies are rapidly developing, it is necessary to build a smart system which helps to recognize the emotions of diverse population.

It is one of the best research areas, which have the number of innovative applications. Some important applications are:

- i) Can alert the system while driving.
- ii) Can be useful during medical practices.
- iii) Can help customers to give their feedback on the interactive TV programs.
- iv) In Psychology.
- v) Can help in recognizing the human behavior.
- vi) Can assist in interview process.

V.CONCLUSION

Over the past two decades, expeditious researches efforts have been carried out in the field of facial emotion recognition. Emotions are considered as the

important and valuable of activity of brain. Emotions are primarily known by face, which typically contains more sense organs. The main goal of this paper is to grant a short introduction about facial emotion recognition system, their applications and proceeding research works in the area of emotion recognition.

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