REAL -TIME EMOTION RECOGNITION THROUGH FACIAL EXPRESSIONS

Abstract:

Emotions are distinct and consistent response to internal or external events that plays a vital role in every human's life. Facial expressions are the most effective way to exhibit emotions and recognizing them, is a biometric feature that carries the emotion of the person. In this proposed work, we've come across emotion recognition by analyzing the facial expressions. The common human emotions are happy, sad, fear, anger, surprise and disgust. These inputs are accustomed to collect the current mood or emotional condition by analyzing the human's facial expressions. It is a motivation for additional analysis in computer-based emotion recognition system and its impact on social and private competency. The model is trained using a supervised learning algorithm referred to as Support Vector Machines, to acknowledge the various emotions of an individual. Eigenface together with Principal Component Analysis is used and result of it'll turn out to produce appreciable efficiency compared to other algorithms. As our project work is concerned with recognizing the emotions of an individual even in inclined and oriented pictures, thus we tend to use Machine Learning in conjunction with OpenCV techniques to resolve the issues.

Problem statement:

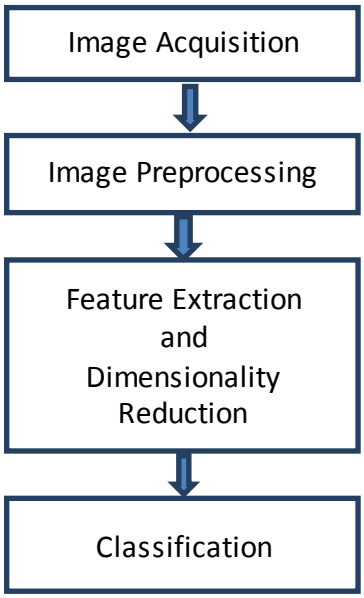
It is aimed at recognizing human motions from static and dynamic images in real time environment.

Objectives:

The main objectives of this proposed system is to overcome the problems of previous research. The following are some of the services provided by RERS system.

- The ability to capture facial expressions, classify them into six universal emotions, and to recognize emotions in real time.
- To create a self-awareness among individuals and providing support to individuals who are afraid to share their feelings which might lead to a depression and self-discouragement and this may affect their personal, as well as their Social life.
- To establish a service so that people will understand to naturally express their emotions when they are interacting with our system.
- To figure out the conditions in which the emotion recognition application can result into objective or subjective measure improvements.
- To provide guidelines on the basis of emotion classification deployment which can give inputs to software developers to meet the user needs.

Flowchart:



1) Image Acquisition:

Image acquisition is the first most step to build a real-time emotion recognition system. We are using Cohn-Kanade as our test database initially to train the model, later image acquisition is done by digital cameras in real-time.

2) Image preprocessing:

Image preprocessing the second step that has to be performed right after image acquisition. Usually, when an image is captured it can be disturbed due to factors such as noise and other unwanted defects which will lead to ambiguity, even if the camera position or environment remains unbiased. Therefore, before you proceed to further processing like feature extraction or the emotion classification, the quality of an image needs to be improved through the series of arithmetic and logical operations performed by predefined packages, known as pre-processing.

3) Face detection:

Face detection is the third step. This is an easy task performed using OpenCV with Python. Detecting the face region in an image is an essential part of any facial recognition system or emotion recognition through facial expressions. This process is ideally performed automatically as soon the person faces the cameras and its produces a very low false positive rate during face detection in the video frame or from the dataset

4) Feature extraction and Dimensionality reduction:

Feature Extraction is the fourth step in our proposed system, where the facial expressions of an individual are extracted and this is one of the most important stages for any of the emotion recognition system software.

5) Emotion classification: The final step of the system methodology comprises of a machine learning model that is trained to perform emotion classification through facial expressions.

Scope:

Facial features like transient and landmarks can be detected using RERS software. Recognition and Compression of the facial muscles which produces the adaption's in the appearance and shape of facial landmarks such as eyebrows and jaw lines with respect to the magnitude and direction of motion on the skin surface and in the momentary facial features appearance such as wrinkles. Because of the varying nature of these facial shape and appearance changes so that we can formulate derived representations to benefit the module of automatic facial action. As we input a training dataset image and observe the Euclidean distance. This distance tells us how close the between input image consisting of two vectors in training data set. On the basis of minimum and maximum distance units we can take a decision of whether the face can is considered as known, or an unknown or not a face at all. This is considered as in input for dimensionality reduction emotion classification.