Depression Recognition: A Survey

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Abstract- *persons who are under depression stage will face many mental and physical disorders. Now days machines are giving very good result based on human depressions. In such low mood both facial expression and voice of the human being will change when Compare to the normal person. Here going to present a novel method by using both visual and vocal expression we are going to find the depression level of a human*

Keywords- Depression, Ridge Regression algorithm, Motion History Histrogram algorithm.

I. INTRODUCTION

The goal of this paper is to give clear idea about human depression. Finding depression level of a human by a machine plays a vital role. As it was an fast growing technology, in near future we may have chance that both human and machine may work together in all the fields. In that situation machine should understand both inner and outer feelings of an human. To analysis this depression we have used some of the technologies like partial least square

II. DEPRESSION

Depression has been considered to be a major disease around 20th country .It is a very dangerous health problem that highly effect the person both personal and social relationship. Depression disorder symptoms is very hard to find out. It is totally different from other disorder symptoms .They have used pattern recognition technique in order to detect the human depression using facial expression, eye movement, head movement ,body movement, heart rate and body temperatures.[1]Person who suffer from depression will behave abnormal in visual and vocal expression when compare to other person. First, they have extracted the features from audio and videos. Second, they have used Long Short Memory Recurrent Neural Network(LSTM-RNN)technique in order to encode dynamic information from audio and videos. Third, In order to boost up the performance Multi Task Learning has been used .Finally it has been evaluated on the Audio Visual Emotion Challenges (AVEC2014) Dataset. [2]

III. RECOGNIZING DEPRESSION

Depression is an emotional and mental breakdown; it may leads to suicide when it is left untreated. so depression have to be cured in starting stage itself. The main reason for depression is state of mind, environment, and/or present circumstance, loads of works, marriage and financial status. A new report have been generated from centers for disease control and prevention shows that depression is more common for women(10.7% of adult women)than men(7.7%of adult men).depression have reached a highest peak between the age 45 and 64 and it damage the entire life span. the general symptoms for depression are shown below: sadness, in sleeping ,lack of energy, fatigue, loss of appetite, reckless behavior. Proper treatment have to undergo in order to solve the depression problems.

IV. FACIAL EXPRESSION

Facial Expression is perhaps the latest and earliest technique. It is one form of nonverbal communication. Hence many approaches have been used in order to classify depression based on facial expression. The main idea behind all these approaches is that depression can be found out using spatial positioning of specific points and region of face.[3]the below tabular column says about facial expression.

TABLE 1:Facial expressions and its Meanings

FACIAL EXPRESSION	MEANING
Suprise	Eyes widen with our pupils growing bigger
Shame	The head usually faces down or with a neutral mouth
Anger	Eyebrows squeezed together Eyelid tight straightened
Fear	Widened eyes Slanted eyebrows Mouth slightly open
Sadness	Face droops downwards Upward slanting of the eyebrows
Happiness	Expressed by smile Crescent-shaped eyes Open teeth
Boredom	Half-open eyelids Face becomes tight for the person

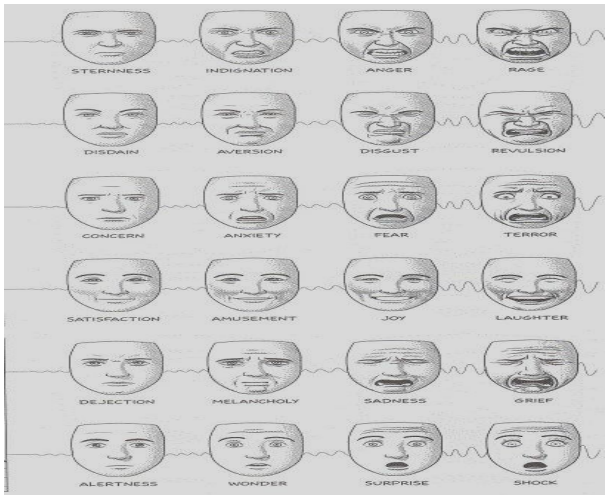

FIGURE 1:Different types of facial expressions

V. TECHNIQUES FOR HUMAN ACTION RECOGNITION

5.1 HISTOGRAM OF ORIENTED GRADIENTS

HOG is a method which has been applied in order to find various human action recognition. histogram of oriented gradients is further divided into four cells. each of these cells contain a gradients that are trilinearly interpolated. using HOG techniques the human action recognition have been achieved successfully. it is used to find feature representation of human but it cannot work efficiently by integral histogram.[4]

5.2 LOCAL BINARY PATTERN

Local Binary Pattern was proposed in the year 1994 by T. Ojala, M. Pietikinen and D. Harwood. LOB is used to improve the efficiency and accuracy of human action recognition. There are two types of pixels have been used in local binary pattern. one is neighborhood pixel and another is an central pixels. the neighborhood pixels should be equal to center pixels. Another is a neighborhood pixels should be larger than center pixels. [4]

VI. GESTURE RECOGNITION TECHNIQUES

6.1 HIDDEN MARKOV MODEL

HMM is a stochastic model and contain two types of chains. I) an underlying markov chain (which is invisible). ii) An stochastic states symbols (which are visible). Hidden markov model is mostly applied for supervised learning pattern recognition task. it contain continuous sequence of output from a particular system. the output is fully based on the model that have been generated yet.[5]

6.2 SUPPORT VECTOR MACHINES

Support vector machines are fully based on two principles. one is statistical learning theory another is convex optimization. it contain many training sets. from the training set we can classify two classes. support vector machine is one of the most useful and efficient method in finding gesture recognition of human.SVM is applied in various applications such as text categorization, handwriting recognition, face detection and bioinformatics.[5]

6.3 KINECT SENSOR

The upgrade version of kinect 2.0 was released by Microsoft in 2014.the initial kinect issued in 2010.it contain three eyes namely RGB camera, IR emitters and microphone array.RGB camera is used to capture color stream. infrared emitters is used to project the close IR spectra. depth sensor which generate depth image of an person or objects. microphone can locate the speech source and identify the speech recognition. six data sources in kinect that are color, infrared, depth, body index ,body and audio. Kinect SDK 2.0 is used to recognize 6 person, 2 person skeletons and 25 joints at same time. [6]

VII. DEPRESSION RECOGNITION TECHNIQUES

7.1 DEEP LEARNING

Deep learning is an research topic that has been adopted towards visual modalities. it is especially used in the form of convolutional neural network(CNN).deep learning is used in various fields such as face identification, image detection, segmentation and classification. the majority of these applications have been achieved by processing movement from CPU to GPU. deep learning is very large and also contain millions of parameters. it act as a major setback in past. at present, there are many variety of deep networks available such as alex net and the VGG network. these network have been trained by millions of images based on their applications. Now they are used as pre-trained networks in many applications and in various fields. [7]

7.2 SPACE –TEMPORAL INTERESTING POINT(STIP)

STIP is used to note the movement of an human in facial area, hands ,shoulder and head etc. it is used to calculate the depression level and performance can also obtained. second, it uses an another feature is LLD, which does not significantly reduce the mean absolute error(MAE) and root mean square error(RMSE)when feature are combined with LBP-TOP features. third, another visual feature have been used, divergence-curl shear(DCS)descriptor, it is used to encode scalar first-order motion features on the optical flow and capture physical properties of the flow pattern in order to improve performance and achieve human depression.[8]

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