

Depression Scale Analysis by Machine in the Field of Artificial Intelligence

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Abstract

Depression is a major disorder, found by individuals everywhere throughout the world. Many people suffer a lot because of depression in personal life as well as in society. As it was a fast growing environment in near future we may get chance that machine will work together with human in the entire field. In near scenario, in absence of human work will be delay. BT in far future machine will occupy the human place in absence of it. In that manner machine should understand both inner and outer feeling of human. The main aim of this paper is to find depression level of human by machine. For finding depression by machine some of the techniques and algorithm have been used. Video clips is given as input. firstly, motion history histogram (MHH) is used in order to separate features in audio and video. secondly, local binary pattern and edge orientation histogram is used in visual side to find outer most part of an image. thirdly, low level descriptor and pitch detecting algorithm is used in audio side to find the voice level of human. finally, ridge regression algorithm assumes a noteworthy part in output side which is used to combine and compare the data's from both visual and vocal side and produce an result.

Keywords: depression, motion history histogram, ridge regression algorithm, dynamic features, modality.

1. INTRODUCTION

The point of the paper is to give clear thought regarding human gloom. Discovering dejection level of a human by a machine assumes a fundamental part. As it was a quickly developing innovation, in not so distant future we may have chance that both human and machine may cooperate in every one of the fields. In that circumstance machine ought to comprehend both internal and external sentiments of a human. To examination this

gloom we have utilized a portion of the advancements like movement history histogram and edge relapse calculation. Our principle commitments stay three overlay: (1) MHH (Movement History Histogram) based dynamic highlights are acquainted with portray the behavioral attributes of outward appearances and naturalistic vocal articulations in discouragement acknowledgment; (2) EOH (Edge Introduction Histogram) and LBP (Nearby Paired Example) are received to feature the edge and surface varieties of worldly points of interest of the Well separately, and their component level combination prompts a more extensive dynamic portrayal. (3) Edge relapse calculation is utilized to anticipate the sadness states by taking in the connection between the dynamic highlights and misery scale in preparing.

2. LITERATURE SURVEY

Speech signal processing is being increasingly explored in human domains, and gives a very good result in it. This paper highlight general issues in health-related speech research and two health applications that is i) addiction counseling ii) autism spectrum disorder. Hence, method ranges from deep supervised learning to knowledge-based signal processing^[1]. automatic recognition system was proposed to predict the affective dimension such as arousal, valence and dominance. first, an visual and vocal features are extracted from image frames and audio segments in facial expression videos. second, wavelet transform based digital filtering method is used to reduce irrelevant noise in the feature space. third, partial least square regression is used to predict the affective dimensions in both video and audio modalities. finally, both the modalities are combined in order to boost the overall performance in decision fusion process^[2]. Depression is one of the most common mental disorders for millions of peoples all around the world. The proposed algorithm is used for dynamically analyzing facial expression using robust descriptor in order to

compose a novel feature selection as well as an effective classification process. Additionally, a preliminary evaluation is present. Local curve let binary patterns are used in three orthogonal planes for depression severity assessment^[3].

3. TECHNIQUES AND ALGORITHMS

- Motion history histogram
- Local binary pattern
- Edge orientation histogram
- Low level descriptor
- Pitch detecting algorithm
- Ridge regression algorithm

3.1 MOTION HISTORY HISTOGRAM

Motion history histogram (MHH) is applied in order to extract the features in videos. As video is a dynamic one, which contain “N” number of features present inside it. Using MHH, all the features are segmented. By doing this it is easy for the machine to find the depression level of a human. The extraction is done by means of two ways i) video ii) audio. MHH is an accurate graphical representation. The initial step is to canister the scope of significant worth, which is partitioning the whole scope of significant worth into a progression of interims and the tally what number of qualities fall into every interim. The container is typically determined as back to back, on covering interims of factors. The canister must be nearby, and are regularly of equivalent in size. The video highlights are extricated independently and sound highlights are removed independently and after that preparing is proceeded.

3.2 LOCAL BINARY PATTERN

Local binary pattern is used to denote the action and movement of an image. It generally contains two values (1’s and 0’s).it divide each cells by means of pixels. For each and every action and movement there contains some values. If the action is done, it denotes as 1’s.if the action doesn’t contain it is denoted as 0’s.local binary pattern monitor some of the actions like eyes movement (whether the eyes is opened or closed)if the human eyes is open it gives value as “1” if not it gives values as “0”.lips movement (whether the person speaks or not) if the human mouth is open it gives value as “1” if not it gives value as “0”.based on each expression, values is calculated and graph have been plotted.

3.3 EDGE ORIENTATION HISTOGRAM

By using edge orientation histogram, shape of an image is identified. It mainly focuses on outermost layer of an image. The step starts from

motion history histogram (MHH) and moves on to edge orientation histogram. Once motion history histogram extracted the features, it divides the image by means of cells and blocks. Each cells and blocks are calculated by means of angles (0^0 , 90^0 , 180^0 , 270^0) and strength. By using edge orientation histogram, the unknown shape of an image can also correctly found. Sobel operator and canny detector are used. The sobel mask contains five orientations: vertical, horizontal, diagonal and non-directional. Canny detector contain same size of the image in matrix form with a “1” if there is an edge present and “0” if there is no edge present.

3.4 LOW LEVEL DESCRIPTOR

Low level descriptor is used in audio side, to find spectral and energy level in audio features. As human voice tone will change each and every second based on the situation. Low level descriptor is a part level outline process that takes after a well ordered process. This procedure is utilized for planning numerous virtual products, information structures and source code. The LLD stage is where the real programming parts are planned. Amid the itemized stage the intelligent and practical plan is done and the outline of utilization structure is created amid the abnormal state descriptor stage

3.5 PITCH DETECTING ALGORITHM

The audio feature is also found by means of pitch detecting algorithm(PPA).where the voice tone is calculated by DB(decibels).the voice tone is calculated from low to loud voice. For each and every tone there contain some range and values. Based on that machine will find the depression level of a human. If the voice is low and the image is sad it denotes some percentage of depression. If the voice is normal and image is sad, it denotes some percentage of depression. So comparing the images and voice tone, the depression level is calculated and plotted.

3.6 RIDGE REGRESSION ALGORITHM

The Ridge regression is finally applied to predict the depression scale. While in the progression of sound process, an arrangement of ghostly Low-Level Descriptors (LLD) highlights is utilized to encode the qualities of the sound. Ridge regression algorithm used in output side. It is used to combine and compare the data’s got from both visual and vocal side. The depression level starts from 12% and moves on to higher level. Based on image and its voice tone the depression level is calculated. The result is denoted by means of percentage.

FACIAL EXPRESSION	MEANING
CONFUSION	Scrunching of forehead and nose, raised eyebrow furthermore, lips tightened together
EXHAUSTION	Half-open eyelids, raised eyebrows
FEAR	Broadened eyes and inclined eyebrows go upwards. One mouth slightly open.
SADNESS	Glare and upward inclining of eyebrows. Face droops downwards.
HAPPINESS	Smile and crescent-shaped eyes, showing teeth with smile.
DISGUST	Eyebrows pulled down and nose wrinkled, upper lip may pull up and lips stay loose.
BOREDOM	Half-open eyelids, raised eyebrows, feeling dissatisfaction.
SUPRISE	Widened eyes and gaping mouth, emotion identified with stun and fear.
SHAME	Eyes downward with sad and worried look, faces down, glaring or with neutral mouth.
FOCUS	Eye fixed, looks upwards or then again have their eyes turned away to the other agree with less flickering.

Figure 3.1 Facial Expression And Its Meanings

4. PROPOSED SYSTEM

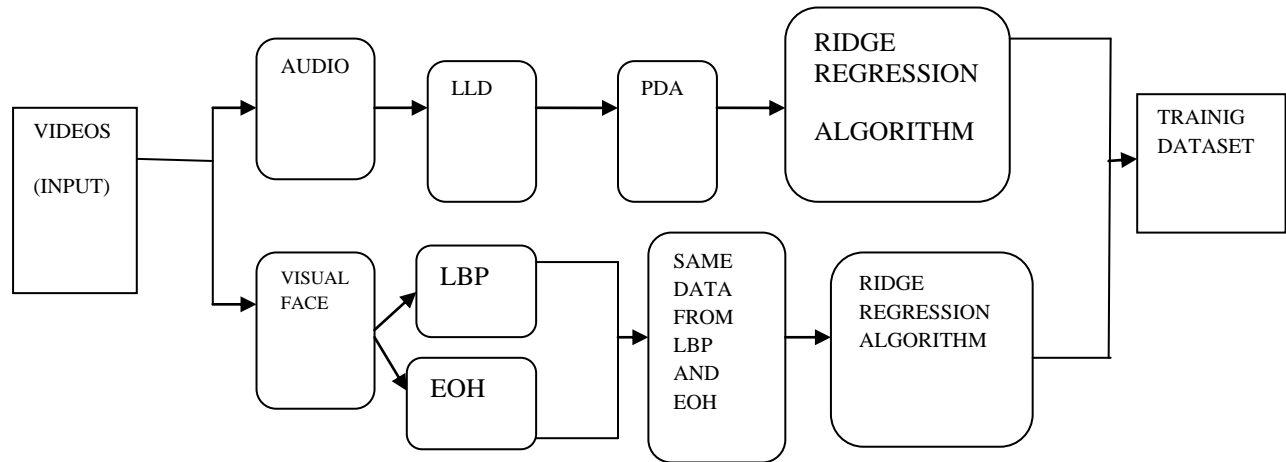


Figure 4.1 Architecture for Finding Depression

The architecture of the proposed system describes the diagrammatic representation of the process flow. The input is given as videos; it is used have many number of features inside the video. All these features are extracted by means of motion history histogram. In visual part, local binary pattern and edge orientation histogram is applied. The binary pattern contain zeros and once. The edge orientation histogram is used to detect the edges. In audio side low level descriptor and pitch detecting algorithm is

used. The fusion is combined to produce an output using ridge regression algorithm.

5. CONCLUSION AND RESULT

The principle point of this paper is to find depression level of a human by a machine. Here video is given as input. Using MHH features have been extracted from video. By doing this it is easy for the machine to find the depression. A novel approach have been used, data's from visual and vocal side are combined and compared produces an output. The output is calculated by means of percentage.

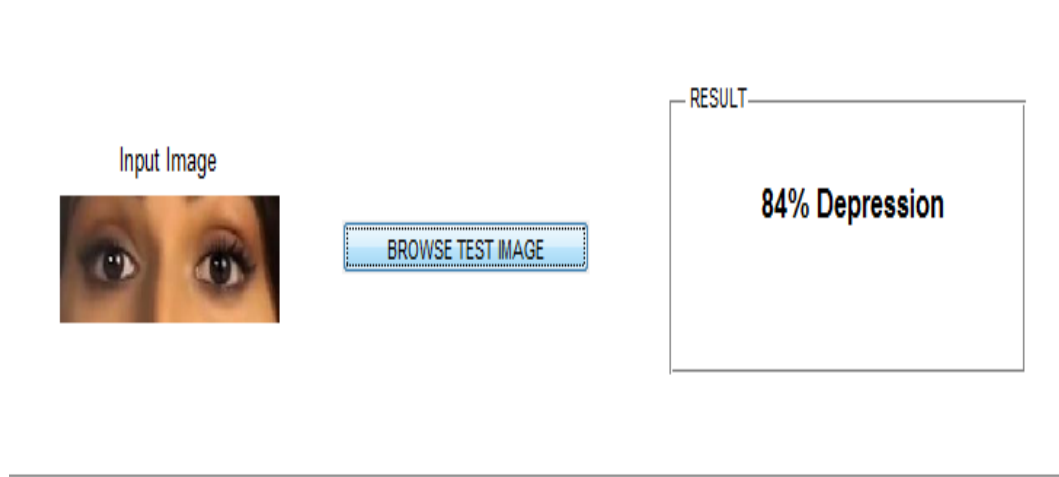


Figure 5.1 Depression Level By Means Of Percentage

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