

Identify Depression Using Machine Learning & Image Processing

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Abstract— Human emotions are an important part of our life. We express our feelings through emotions. When a person is sad, then the person causes a stress. But when that stress goes more than a week then such a condition called as a depression. Depression is caused due to the people live at fast life structure and cause pressure in their workplace, family etc. The aim of review paper specifically gives the methods for recognition of face, classification techniques for detection of different face parts like eyes, lips etc. By using this techniques and algorithm one can collect the database for depression analysis. Hence with the help of techniques and algorithms described in paper, it is easy to detect the depression without the physical presence of doctors.

Key words: Depression Assessment, Facial Expression, Machine Learning, Feature Selection, Pattern Recognition

health disorders people suffering from depression tend to loss interest, how low mood, feel hopeless or have social isolation.

At a worst depression can lead to suicide .There are few numbers of studies investigating deeplearning techniques. Classify social network user with depression .Most of the classical machine learning techniques. Example:- regression ,decision tree this project aim of develop a deep learning predictive model of classify users with depression[1][2] .Because depression is a recurrent disease.IT is interesting in finding unusual patterns in users generated content over time .Social network posts over time where extracted for time services data. This predictive model is obtained by classification of deep learning of deep learning technique.

I. INTRODUCTION

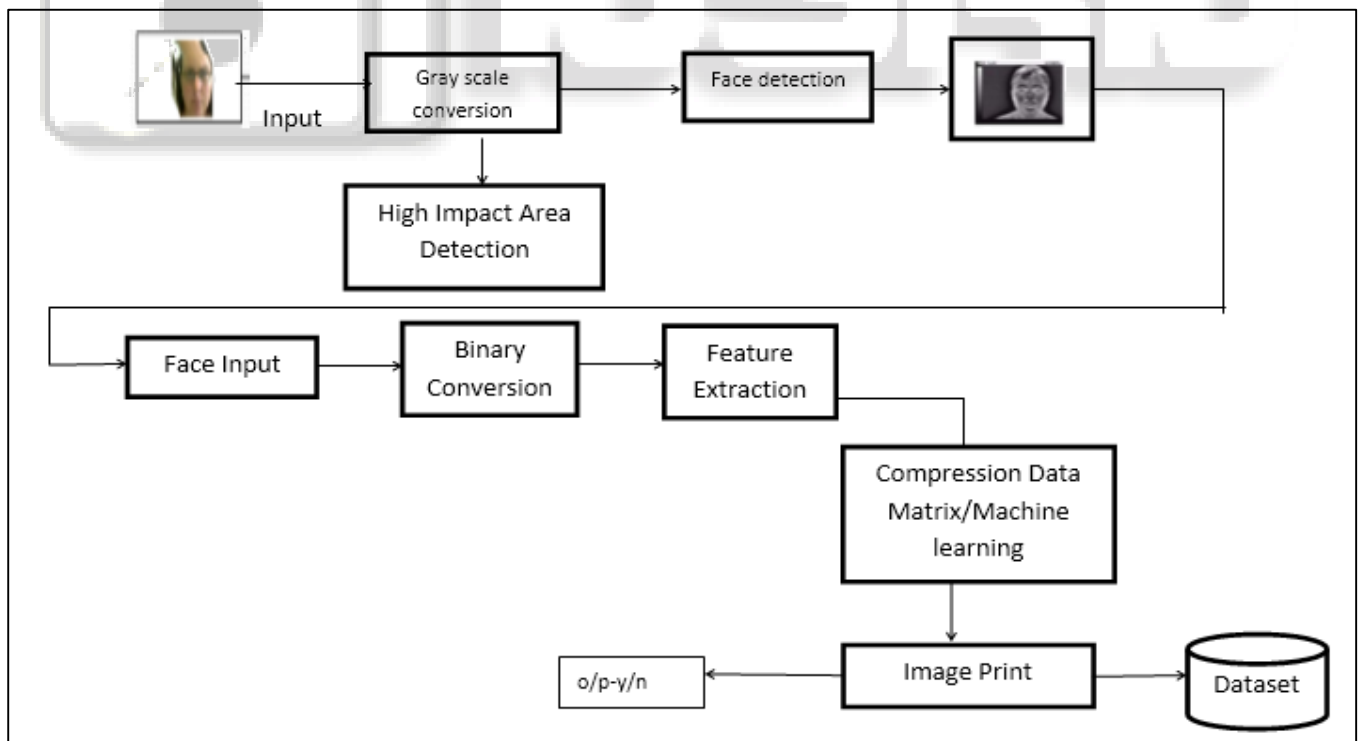
We present the Assessmentof depression using machine learning to detect the whether the person is depressed or not. For detecting person is depressed or not first we have to detect the face. Then from that face we can decide this person is depressed or not[5].

Over 320 million of people are suffering from depression in world wide. Depression is a common mental

II. GOALS AND OBJECTIVES

- The face image captured is now used in the face recognition process.
- Face plays a big role in conveying identity and emotion, being the primary focus of attention in social life.
- Face recognition can be applied to criminal identification, security systems, image and film processing and human computer interaction.

III. ARCHITECTURE DESIGN



A. Feature Extraction:

Feature extraction is important step in the processing workflow.[1]. Feature can be classified into high and low level. High level features directly translate to human common

sense, while low level features are based on “traditional” image processing descriptors. They are having two approaches a) geometry based and b) appearance based. Depending on the approach, the software package mentioned in preprocessing could SEMAINE API, CERT etc[3].

Geometrical features,[3][2] such as edges, corners, coordinates, and dimensions are often used to represent facial expressions.

Functional derived from the time series of geometric features are quite popular. Some examples are average, minimum, maximum and values of displacements, velocities, or accelerations of the coordinates that define the face region as a whole.

Appearance based approaches defined the full-face based features. LBP are used for this approach.

1) Machine learning face detection feature extraction / principal components analysis

A PCA may help to explain a system and to study effects of different components of a system to predict the behavior of system[2]. The mathematical modeling for our system is as follows

$$S = \sum, F, \delta, C$$

S = FaceRecognition.

\sum = set of input symbols = image, character in formation

F=set of outputsymbol = MatchFoundthen notificationouser, NotFound δ =

1. Start
2. Readtrainingset of Nimages
3. ResizeimageN * 1dimensionsto
4. Selecttrainingset of Dimensions, M : number of sampleimages
5. Find average face, subtract from the facesinthetrainingset, creatematrixA Where, Ψ = averageimage, M = number of images, and i = imagevector.

$$\varphi = \frac{1}{M} \sum_{i=1}^M \gamma_i$$

i = i Where, i = 1, 2,3M. A = [1, 2,3M]

6. Calculate covariancematrix: AA0
7. Calculate eigenvectors ofthecovariancematrix
8. Calculate Eigenfaces = No. oftrainingimages no. of classes(totalnumber of people) of eigenvectors.
9. Create reduced eigenfacespace –Theselected set of eigenvectorsaremultipliedbytheAmatrixtoreduce deigenface
10. Calculate eigenface ofimageinquestion.
11. CalculateEuclidiandistancesbetweentheimageandthe eigenfaces.
12. FindtheminimumEuclidiandistance.
13. Output :
imagewiththeminimumEuclidiandistanceorimage unrecognizable C = Eigenfaceswillgeneratethegrayscaleimages,thealgorithm willrunonlyon key frames.

2) Feature Extraction/LBP(Local Binary Pattern)

These techniques introduce a new algorithm of the feature extraction based on the LBP(Local Binary operator). Using LBP operator the features of each image are extracted, in a way that the face image is divided into small regions (blocks)and the binary pattern histogram are extracted (a binary code is extracted from each neighboring pixel)[4].

Introduced the original LBP operator which is regarded as a strong tool for describing image texture. By selecting the 3*3 neighboring region of each pixel with a central value as threshold and taking the resultsas a binary

number into account, the pixels are labeled. Afterword's the histogram of the tables is used as an image descriptor in the matching, later LBP is extended to operate on the circular regions with different sizes. To indicate the circular regions notation (P,R) is used, by connecting the binary patterns on enhanced feature histogram is generated and the face image is significantly represented

Example (Binary: 11010011 => Decimal: 211)

3) Depression Datasets

Different datasets are used for assessment of depression. AVEC is fully available datasets and is freely downloaded. Also a different datasets are available Pittsburgh, BlackDog, DAIC-WOZ etc. These datasets are storing the different faces of the same person of taking the image on different angles, and expression on the depression.

IV. MOTIVATION:

The present work is a systematic review of existing methods for automatic detection and/or severity assessment of depression. Emphasis is given to approaches utilizing visual signs from the image processing and machine learning perspective in an at- tempt to fill the gap of previous comprehensive reviews.

V. LITERATURE SURVEY

1) Pampouchidou K.Marias, M.Tsiknakis, P.Simos and F.Yang F.Meriaudeau "Designing a Framework for Assisting Depression Severity Assessment from Facial Image Analysis"

Face detection is first and important part .Because after detecting the face, analysis of depression is possible.Face detection techniques were used are Knowledge based method,Feature Invariant method, Template matching method,Appearance based method.In Face Normalization As image is corrupted by noise,uneven illumination [5],pose effect face normalization is done. In Feature Extraction Three types of models were used for feature extraction Appearance based model which is based on structure ,geometry and histogram of an image, Model based , and Motion based model. Infusion and classification. Firstly the signals other than the facial expressions fused together to make it as a one vector unit and then by using KNN classification is done.The extracted features were given to the KNN classifier to identify the appropriate emotion class (Happy, Sad, Neutral, Surprise and Fear)

2) R. E. Roberts, et al., "Screening for Adolescent Depression: A Comparison of Depression Scales,"

Depression prediction in adolescence (between ages of 6 to 15) was done. This paper examines the possibility of depression which is going to develop after 1 to 2 years in adolescence. In this paper, database is obtained from the at risk adolescence facial images and nit at risk facial images. Prediction of depression was followed by 2 years of data collection. For this approach, two approaches for detection of depression by facial images were followed. First approach is Eigen face. Eigenface means it uses PCA approach. And the second method is fisher face.It used PCA and LDA method. PCA and LDA are two feature extraction approaches. Nearest

neighbor approach were used to classify person dependent and person independent type.

3) Jeffrey Cohn, Ellen Frank, Zara Ambadar, Joan Buttenfield, Kate Jordan, Javier Montano, Manuel Quero, and Nicki Ridgeway "detecting depression by facial actions"

This paper compares the depression analysis method between clinical diagnoses with automatically facial actions of patient who suffered through depression.

4) Jingwen Bian, Yang Yang, Hanwang Zhang, Tat-Seng Chua, "Multimedia Summarization for Social Events in Microblog Stream", *IEEE Transactions on Multimedia*, 2014.

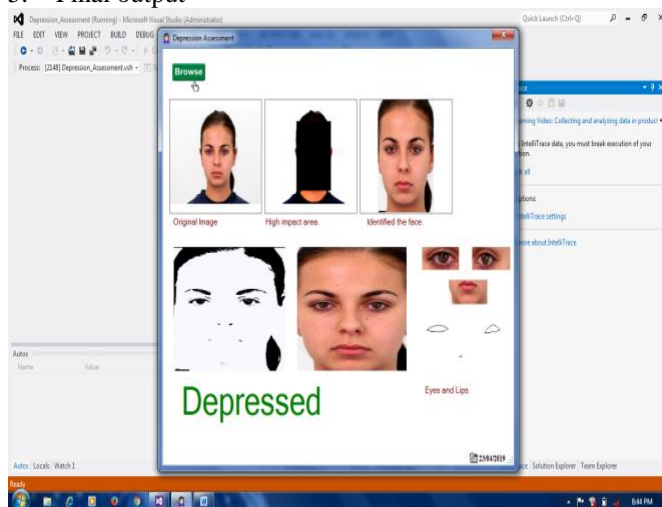
In this paper, authors present a multimedia social event summarization framework which automatically generates holistic visualized summary from the microblogs of various media types. The presented framework features the exploration of the intrinsic correlations among different media types for enhancing the summarization performance. In particular, authors developed three major stages to accomplish the summarization. First, devise an effective approach for eliminating the potentially noisy images from raw microblogs image collection. Then, a novel Cross-Media-LDA (CMLDA) model, to discover sub-events from microblogs of different media types. Finally, generated multimedia summary for social events utilizing the cross-media distribution knowledge of all the discovered sub-events.

VI. RESULT

In this paper we have to find user is depressed or not. Following steps we have to performed the identifying the depressed user.

Steps:

1. Login the system using correct username and password.
2. Uploading the image.
3. After uploading the image it detecting the face
4. After face detection convert the image into grey scale and extract the features.
5. Final output



VII. FUTURE SCOPE

Further this system we can made online. They also used for the high temperature people by continuous observation on using CCTV camera

VIII. CONCLUSION AND FUTURE SCOPE

Assessment of depression system can able to provide the proper training set of data and test input for recognition. The face matched or not is given in the form of picture image if matched and text message in case of any difference. It was further made apparent that visual cues need to be supplemented by information from other modalities to achieve clinically useful results..

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