



Depression detection using Machine Learning and Deep Learning

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Abstract: A method for real monitoring of the heart for depression episodes is described here. We have developed a convolutional neural network (CNN) based machine learning algorithm for classifying into depression episodes of the heart with an accuracy over 92%. Our algorithm is capable of detecting depression episodes of varying duration. The algorithm is evaluated using Database. The best results obtained here are 0.95%, 0.98%, and 0.91% respectively for accuracy, sensitivity, and specificity.

Keywords: CNN, image preprocessing, depression, Depression Detection.

I. INTRODUCTION

Depression and anxiety disorders are highly prevalent worldwide. Attention to the adverse effects of depression on patient health, as well as its associated economic burden has been warranted. To support objective depression assessment, the affective computing community engaged signal processing, computer vision and machine learning approaches for analyzing verbal and non-verbal behavior of depressed patients and made predictions about what patterns should be indicative of depressed state. These studies have analyzed the relationship between objective measures of voice, speech, non-verbal behavior and clinical subjective ratings of severity of depression for the purpose of automatic depression assessment. Despite major advances have been achieved in recent years, there are still several open research directions to be solved in the study of depression: • Audio and video features from individual only concern the paralinguistic information, such as speaking rate, facial action units (AUs), etc. rather than the linguistic information from the speaking content, which can reflect the sleep status, emotional status, feeling and other life status of the individual. It is important to explore more effective audio, visual, linguistic and other multi-modal features, and design multi-modal fusion framework for depression recognition. • Due to the privacy issues, only limited depression datasets are currently available, and there are barely pre-training models for depression. Moreover, these commonly used depression datasets also lack consistency. They have different languages, different durations, different data types and different targets, which make them difficult to be combined to increase the number of samples, therefore difficult to take advantage of deep models. Adopting some data augmentation approaches to increase the number of samples are requisite to improve the model performance. • Depression is a state of low mood and aversion to activity. From this perspective, the study of depression should be closely related to affective state. However, the current researches on depression and affective state are relatively independent. We hypothesize that combining depression estimation and dimensional affective analysis simultaneously would yield more powerful depression analysis.

II. EXISTING SYSTEM

In existing system, A method for real monitoring of the heart for depression episodes is described here. We have developed a SVM and other algorithms-based machine learning algorithm for classifying ECG signals into normal or depression episodes of the heart with an accuracy over 70%. Our algorithm is capable of detecting depression episodes of varying duration. The Existing algorithm is a powerful method to detect depression episodes of different duration. Both sensitivity and specificity are above 91% for both subject independent and subject dependent cases. A method for continuous monitoring of the depression is also described.

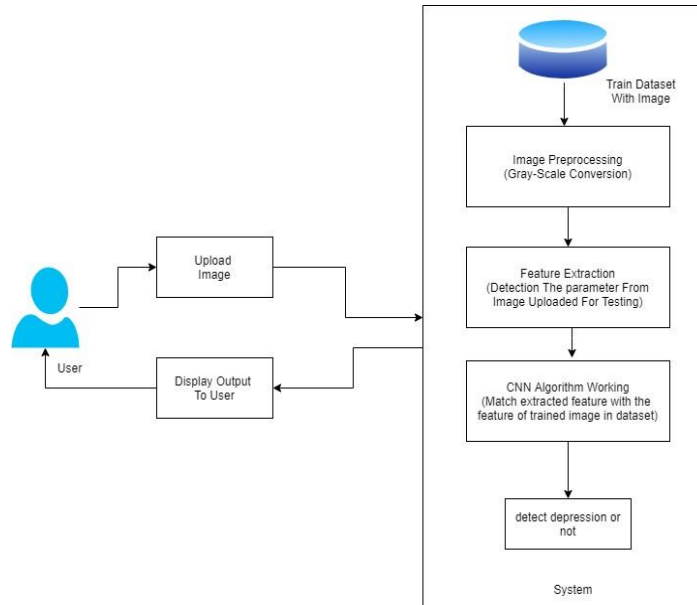
In earlier system, they need hospital to find out the extend of depression, they used blood, disease and symptoms to check whether the person is depressed or not.

Flaws in that system were person need to go to hospital to check depression.



III. PROPOSED SYSTEM

System Architecture



Description

1. Image Pre-processing:

Image pre-processing is the term for operations on images at the lowest level of abstraction. These operations do not increase image information content but they decrease it if entropy is an information measure. The aim of pre-processing is an improvement of the image data that suppresses undesired distortions or enhances some image features relevant for further processing and analysis task.

2. Feature Extraction:

Feature extraction is a process of dimensionality reduction by which an initial set of raw data is reduced to more manageable groups for processing. A characteristic of these large data sets is a large number of variables that require a lot of computing resources to process. Convolution layer. A convolution layer is a fundamental component of the CNN architecture that performs feature extraction, which typically consists of a combination of linear and nonlinear operations, i.e., convolution operation and activation function. The biggest advantage of Deep Learning is that we do not need to manually extract features from the image. The network learns to extract features while training. You just feed the image to the network

3. CNN Algorithm:

CNN (convolutional neural network) is based method matched the state-of-the-art for the dataset with macroscopic images, and outperformed the best-published results on the microscopic images. The performance of proposed CNN architecture also surpasses exist texture descriptors for forest species recognition. To the best of our knowledge, deep-learned features from spectrogram for depression recognition has not yet been explored. Accordingly, in this work we explore the process.

IV. MODELLING AND DESIGN.

DATA DESCRIPTION:

The dataset we have used is prepared by Lozada and Crestani [14]. The data has been collected from the social media platform reddit. This dataset has been utilized in the “eRisk 2017” [15] challenge. The users that were considered to be



depressed were users who explicitly mentioned on reddit that they were diagnosed with depression. Posts such as “I have depression”, “I think I have depression”, or “I am depressed” were not considered as depressed. Only posts such as “In 2013, I was diagnosed with depression” and “After struggling with depression for many years, yesterday I was diagnosed” were considered as posts of users suffering from depression. The reddit 36 users with such posts were followed up with strict manual reviews for the purpose of authenticity and only then they were considered to be users belonging to the depressed class.

V. FUNCTIONAL MODEL AND DESCRIPTION

1) Data Flow Diagram

In Data Flow Diagram, we Show that flow of data in our system in DFD0 we show that base DFD in which rectangle present input as well as output and circle show our system, In DFD1 we show actual input and actual output of system input of our system is text or image and output is rumor detected likewise in DFD 2 we present operation of user as well as admin.

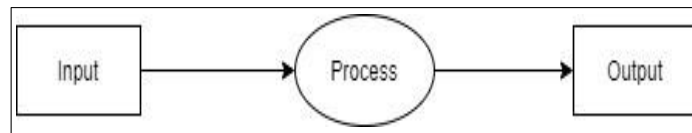


Figure 4.1: Data Flow

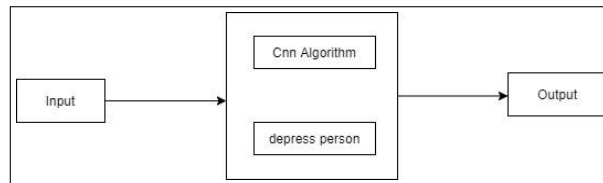


Figure 4.2

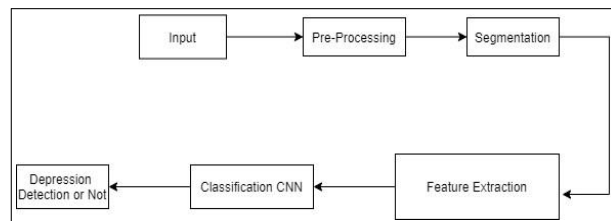
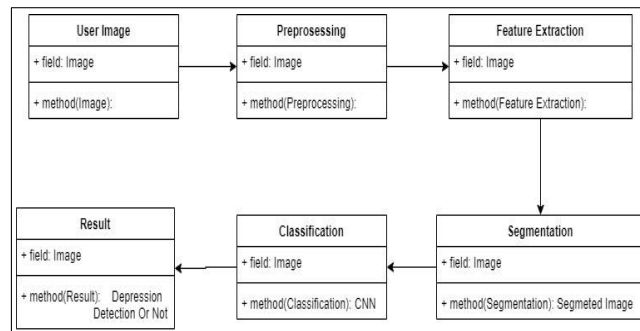


Figure 4.3

CLASS DIAGRAM





CONCLUSION

Depression occurs commonly, causing suffering, functional impairment, increased risk of suicide, added health care costs, and productivity losses. Effective treatments are available both when depression occurs alone and when it co-occurs with general medical illnesses. there are using CNN algorithm, by using machine learning and in future the project implement in other technology also.

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