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Automatic Level Depression Detection

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Abstract: *Depression is the most comprehensive mood ailment that has a notable influence on mental health as well as hindrances in daily life. Machine learning models have contributed to the field of emotion detection in all areas including audio, visual and internet based text data. The idea directs at developing a machine learning based model utilising images and video as an input, to analyze the level of depression among users. Based on the analyzed features the individual will be classified into either of the following depression categories: Minimal, Mild, Moderate, Severe. In the process of depression level detection, the two crucial components are video input and the Beck Depression Inventory II. The solution generates as a result of the correlation between emotion vector and inventory vector represented using visual graphics.*

Keywords: Depression Detection, Machine Learning, Convolutional Neural Network, Beck Depression Inventory-II, Correlation, Facial Expressions.

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 analysing verbal and non- verbal behaviour of depressed patients [1] and made predictions about what patterns should be indicative of depressed state. These studies have analysed the relationship between objective measures of voice, speech, non-verbal behaviour 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 common 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. PROPOSED WORK

2.1 CNN

Convolutional Neural Networks specialized for applications in image & video recognition. CNN is mainly used in image analysis tasks like Image recognition, Object detection & Segmentation.
There are Four types of layers in Convolutional Neural Networks:

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1. Convolutional Layer: In a typical neural network each input neuron is connected to the next hidden layer. In CNN, only a small region of the input layer neurons connect to the neuron hidden layer.
2. Pooling Layer: The pooling layer is used to reduce the dimensionality of the feature map. There will be multiple activation & pooling layers inside the hidden layer of the CNN.
3. Flatten: - Flattening is converting the data into a 1-dimensional array for inputting it to the next layer. We flatten the output of the convolutional layers to create a single long feature vector.
4. Fully-Connected layer: Fully Connected Layers form the last few layers in the network. The input to the fully connected layer is the output from the final Pooling or Convolutional Layer, which is flattened and then fed into the fully connected layer.

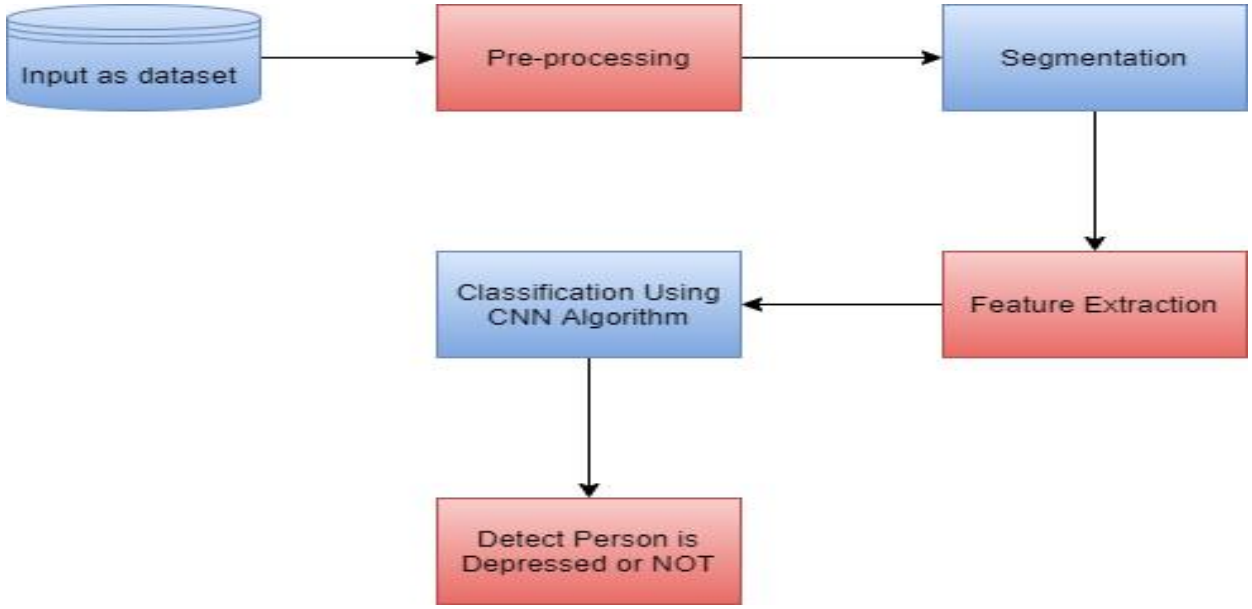
2.2 Harcasscade Algorithm

It is an Object Detection Algorithm used to identify faces in an image or a real time video. The algorithm is given a lot of positive images consisting of faces, and a lot of negative images not consisting of any face to train on them. The model created from this training is available at the OpenCV GitHub repository.

The repository has the models stored in XML files, and can be read with the OpenCV methods. These include models for face detection, eye detection, upper body and lower body detection, license plate detection etc.

III.UML DIAGRAM

3.1 Flow Chart



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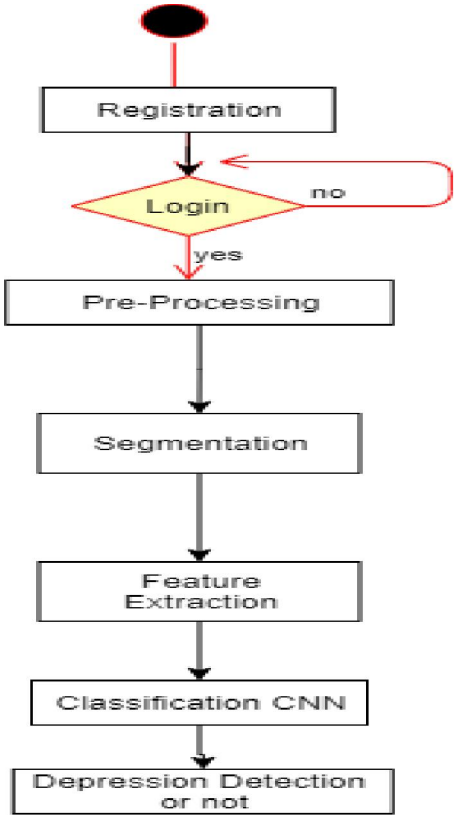
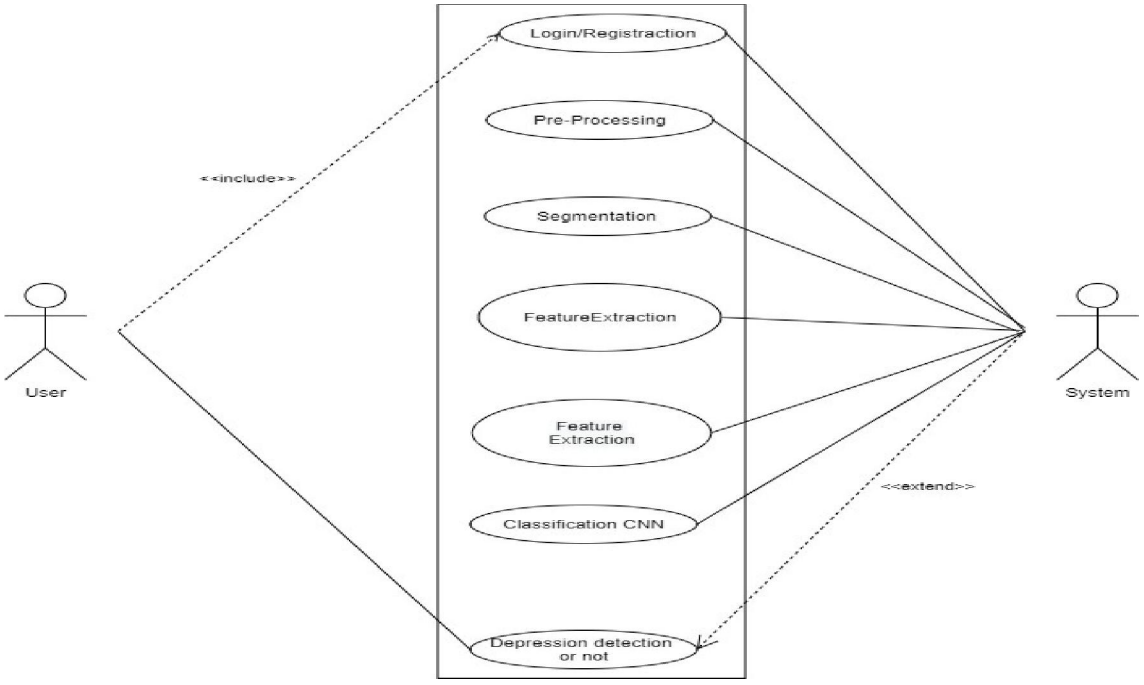
3.2 Activity Diagram



3.3 Use Case Diagram



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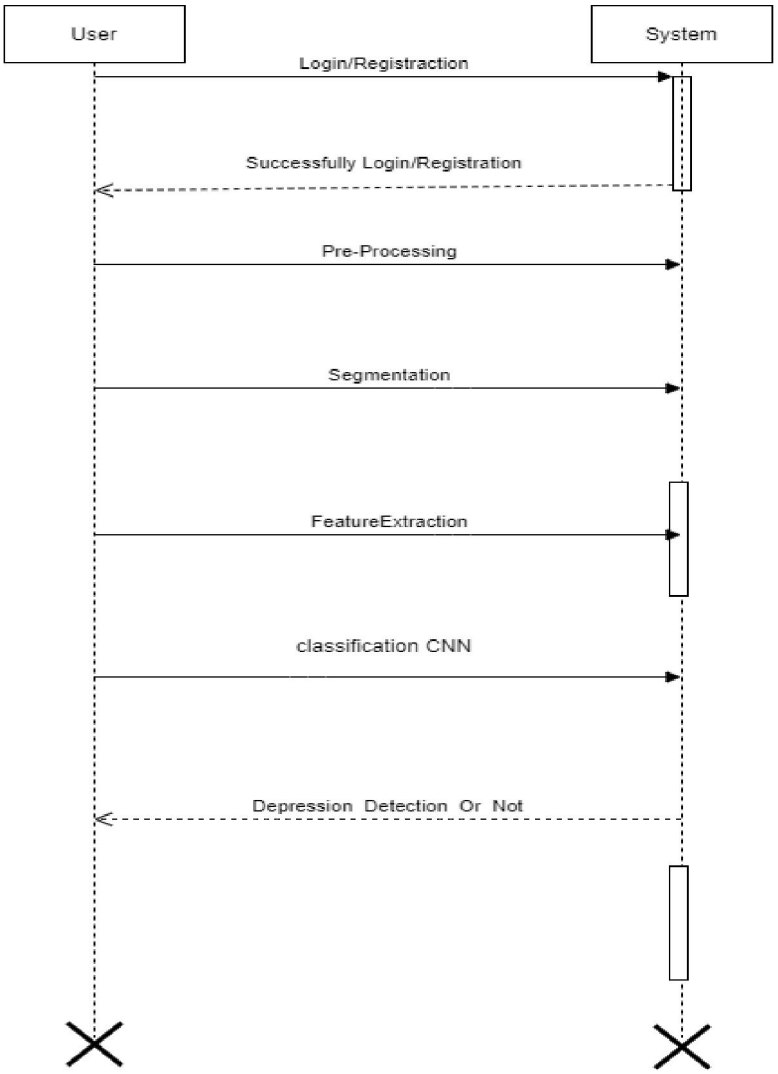
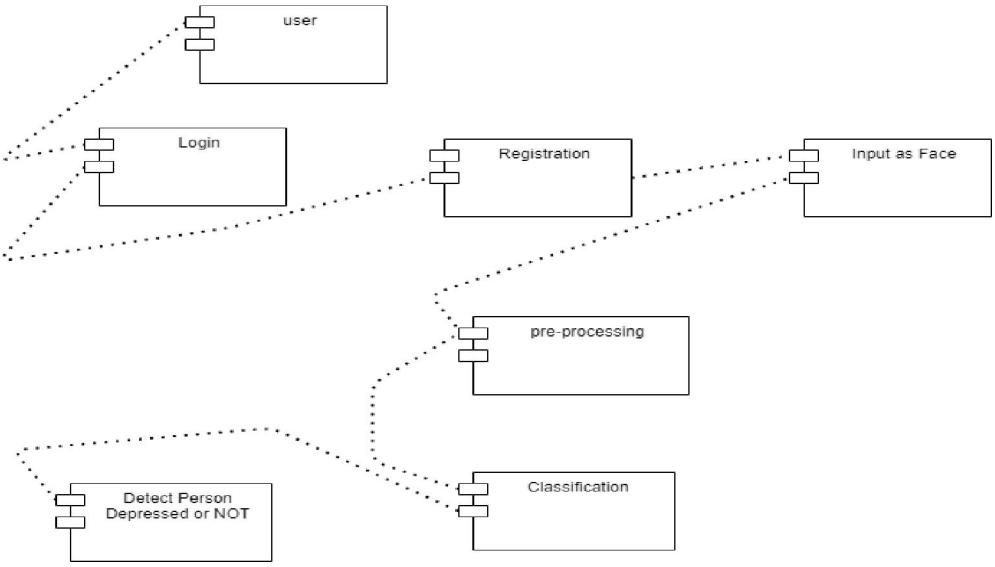
3.4 Sequence Diagram



3.5 Component Diagram



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IV. HARDWARE AND SOFTWA REREQUIREMENTS

4.1 Software Requirements

- IDE : Spyder
- Coding Language : Python Version 3.8
- Operating System : Windows 10 (64 Bit)

Hardware Requirements

- RAM : 8 GB
- Hard Disk : 500 GB
- Processor : Intel i5 Processor
- Speed : 2.5 GHz

V. APPLICATIONS

- Detect Depression or stress
- Medical / hospitals
- Used Normal person

VI. CONCLUSION

To Conclude, That in system we will detect person is depressed or not using face recognise(Like happy, sad , Neutral or Angry). The Deep learning technique is used CNN algorithm. With the help of These CNN algorithm and Haarrcassscade Face recognize algorithm To detect depressed person. This method of detecting tension will assist To determine one's psychological state and also physical health, a person from He / she will be capable of taking the steps expected. It was concluded too, that The more properties we use, the more detailed the model becomes.

VII. ACKNOWLEDGMENT

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