

# Artificial Intelligent System for Automatic Depression Level Analysis

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**Abstract:** Depression is the most predominant mind-set problem overall essentially affecting prosperity and usefulness, and significant individual, family and cultural impacts. The early and precise discovery of signs identified with despondency could have many advantages for the two clinicians and impacted people. The current work pointed toward creating and clinically testing a technique ready to distinguish visual indications of discouragement and backing clinician choices. Programmed sadness appraisal dependent on obvious signals is a quickly developing examination space. The present thorough survey of existing methodologies as detailed in north of sixty distributions during the most recent ten years centers around picture handling and AI calculations. Visual appearances of sadness, different methodology utilized for information assortment, and existing datasets are summed up. The survey diagrams techniques and calculations for visual component extraction, dimensionality decrease, choice techniques for classification and regression approaches just as various combination systems. A quantitative meta-examination of detailed outcomes, depending on execution measurements hearty to risk, is incorporated, distinguishing general patterns and key irritating issues to be considered in ongoing investigations of programmed sorrow evaluation using viewable prompts alone or in blend with obvious signals. The proposed work also carried out to predict the depression level according to current input of face images using deep learning.

**Keywords:** Convolutional Neural Network, Deep Learning, Dataset, Depression

## I. INTRODUCTION

In many situations humans who are depressed are totally ignorant of their disturbed mental condition. They are unable to identify the cause of constant unhappiness in them and eventually such students fall into a state of mind where they start having suicidal tendencies. In some cases students do know that they are suffering from depression, but they are hesitant to seek any kind of help from anyone mainly due to the wrongly conceived notion of 'humiliation' associated with depression. It is better to identify the signs of depression at initial stages of depression. Depression if identified in the initial stages, just a simple one hour talk with a counselor may be of immense help for the student. This may totally change the negative state of mind of that student into a positive one. Such a student can be given good counseling of how to deal with mental stress and can be guided to follow the right path to success. The most important form of non-verbal communications is facial expressions of a person. Many studies have been done for finding out the facial expressions that are related to depression. The current work is mainly undertaken to find out the presence of depression in college students by studying their facial features. This system mainly uses different image processing techniques for face detection, feature extraction and classification of these features as depressed or non-depressed. The system will be trained with features of depression. Then videos of different students with frontal face will be captured using a web camera. Then the facial features of these faces will be extracted for prediction of depression. Based on the level of depression features the student will be classified as depressed or non-depressed.

- Facial mood detection according to time series image inputs
- Predict mood level based on score or weight with class label.
- Successfully implement the test model based on training set as supervised learning approach.
- Execute the proposed system maximum accuracy.

## **II. LITERATURE SURVEY**

Many studies have been conducted to recognize the exact looks that are identified with discouragement. A review has been led for discovering Action Units (AU) identified with various feelings showed by discouraged patients [1]. The presence of AU12 which is related with feeling grin was low in profoundly discouraged patients. The presence of AU14 identified with feeling scorn and AU10 identified with feeling disdain was likewise present alongside AU12. The video information for this review was gathered through clinical meetings of discouraged patients just as non-discouraged patients. The outcomes showed that AU14 identified with feeling scorn demonstrated generally precise for sorrow location.

Highlights identified with eye development to comprehend the eye action of the discouraged and elements identified with head present development to comprehend the head development conduct of the discouraged has been done in [2]. The characterization of the highlights identified with eye action showed higher importance in recognizing serious sadness. Location of gloom from facial elements should be possible by estimating 'Multi-Scale Entropy' (MSE) on the patient meeting video. [4] MSE assists with discovering the varieties that happen across a solitary pixel in the video. The entropy levels of exceptionally expressive, non-discouraged patients were high. The entropy level was low for discouraged patients who were less expressive of their feelings.

Another review introduced a strategy which utilizes examination of facial math alongside investigation of discourse for melancholy location [3]. This work says that the articulations related with melancholy are viewed as in lower frequencies in more modest span recordings. Consequently, longer time recordings should be caught for successful despondency location. Datasets are additionally made by catching recordings of patients while noting clinical meetings. Interviews recorded were for both for discouraged patients just as non-discouraged patients. Recordings are additionally recorded from the finding of sorrow till the patient has improved. [1][4]. Studies showed that there is a huge connection between facial elements and vocal conduct of the discouraged [5].

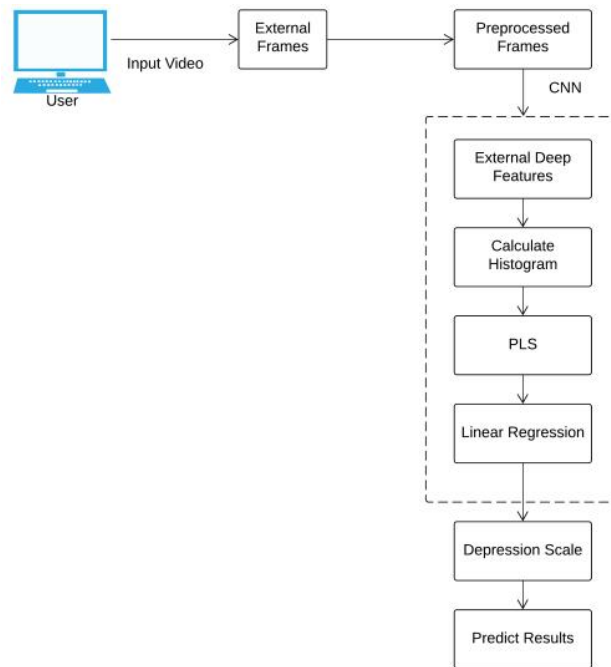
In specific investigations, patients were given wearable devices to screen their actual wellbeing, passionate conduct and social communication for distinguishing misery [6]. A few analysts have gathered datasets by showing people filmstrips to catch the looks of subjects watching them. Information is additionally gathered by giving an undertaking of perceiving negative and positive feelings from various facial pictures [7]. Rather than investigating a video for sadness identification outline by outline, better outcomes have been got for location of wretchedness when the video is considered in general. [8] For this the patient's face locale is first instated physically. Then, at that point, KLT (KanadeTomasi-Lucas) tracker is utilized to follow the face all through the video. The KLT tracker removes shape data from a picture, for example for a miserable articulation the sides of the mouth would be calculated down. Video based methodology showed more precision as it sums up the face area all the more precisely thus the moment developments inside the face locale are additionally considered for melancholy recognition.

The understudies experiencing melancholy would show less mindfulness in homerooms. Assuming the understudies' feelings are planned to the exercises done in homeroom, their enthusiastic state can be seen if they are discouraged or not, and in light of this the educator can help the understudy by focusing harder on that specific understudy. [11] If various appearances in a similar scene show a similar positive or negative feeling, it would assist with understanding the entire circumstance of the scene, regardless of whether subjects in the scene are cheerful or whether something wrong is going on in the scene [12].

## **III. PROBLEM STATEMENT**

The proposed research to design and implement a system for depression level prediction using deep learning, the visual features has extracted from users face and predicts the scale of depression.

#### IV. PROPOSED SYSTEM

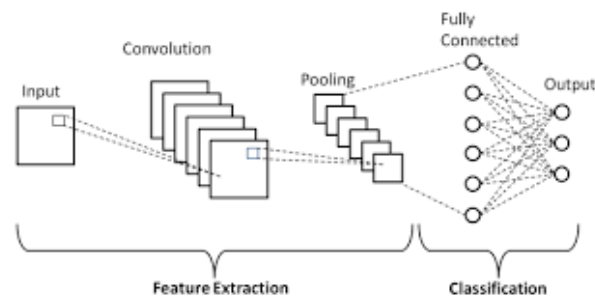


**Figure:** System Architecture

Following is the methodology used in proposed system

- The image data were collected from Kaggle.
- The collected dataset is divided into 2 parts. i.e.:- 80% for training and 20% for testing
- Various Techniques like preprocessing, feature extraction is applied
- CNN was used for classification
- Web application is been developed using php and bootstrap for frontend and Python for backend.
- The user captured image is passed and captured images feature are extracted.
- Extracted Features will be matched with the trained model, depending on nearby match the predicted output is been obtained

#### 4.1 Algorithm Used CNN



#### 4.2 Why CNN?

- CNNs are used for image classification and recognition because of its high accuracy.
- The CNN follows a hierarchical model which works on building a network, like a funnel, and finally gives out a fully-connected layer where all the neurons are connected to each other and the output is processed.
- Hence, we are using Convolutional Neural Network for proposed system

### V. CONCLUSION

In the proposed framework this technology Hand Gesture can be recognized with the CNN algorithm will provide us the best result. The Hand Gesture Recognition will provide a two-way communication which helps to interact between the impaired people to normal people without any difficulties by recognizing the alphabets or number the person wants to say. Hence the implementation system can translate Sign Language and predict character and numbers.

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