

Emotion Recognition and Depression Detection Using Deep Learning

**Pankaja Chavan¹, Priyanka Shevkar², Gitanjali Mali³, Pragati Gaikwad⁴,
Dr. Tambe.S. N⁵**

^{1,2,3,4}*B.E. Students, Dept. of Information Technology Engg. S.N.D COE, Yeola, Maharashtra, India*

⁵*Asst.Professor, Dept. of Information Technology Engg.S.N.D. COE, Yeola, Maharashtra, India*

Abstract –

One of the most significant social health issues in contemporary culture is suicide. Suicidal ideation, often known as suicidal ideas, are people's plans to harm themselves. It can be used as a suicide risk indicator. The yearly suicide rate in India is among the highest in the world. to develop and implement a model that uses facial expressions as signs and symptoms. Finally, depending on the aforementioned two methods, we may make a final decision. to create a web application for the aforesaid system and to produce a thorough dashboard of the user's sickness condition. In order to quickly identify instances of depressed characters and develop a strategy for learning about high-quality responses to questions, we'll employ the CNN algorithm. Behavioral health issues. We recommend system learning as a scalable and effective strategy. We provide documentation of the suggested approach in use. Through the use of a variety of different psycholinguistic aspects, we assessed the effectiveness of our suggested method. We demonstrate that the accuracy and category blunders price may be significantly improved by our suggested strategy.

Key Words: Suicide rate, Emotions, Convolutional Neural Network.

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I. INTRODUCTION

In the Indian setting, suicide is a significant concern. In our nation, suicide claims more than one lakh (one hundred thousand) lives per year. The suicide rate has gone up from 7.9 to 10.3 per 100,000 people in the previous 20 years. Within the nation, there is a huge range in the suicide rates. Kerala, Karnataka, and Andhra Pradesh are states in the south. The suicide rate is greater than 15 Andhra Pradesh and Tamil Nadu, whereas it is less than 3 in the northern states of Punjab, Uttar Pradesh, Bihar, and Jammu & Kashmir. Over the past twenty years, this erratic pattern has remained constant. The greater suicide rates in the southern states may be attributed to factors such as more literacy, a better reporting system, less external hostility, higher social position, and higher aspirations. The statistics indicated that the most common methods of suicide during the year were "hanging" (53.6%), "eating poison" (25.8%), "drowning" (5.2%), and "self-immolation" (3.8%). The research used information from the 2016 WHO Global Health Estimates to provide suicide rates for various nations and geographic areas. When classified according to region and income, India is part of the South-East Asia region and the Lower Middle-Income group of countries. India's suicide rate (16.5) was higher than the rate of its geographic region (13.4) and the rate of its income group (11.4).

1.1 Motivation of Project

According to the most recent National Crime Records Bureau (NCRB) data, India reported 381 suicide deaths each day in 2019, totaling 1,39,123 fatalities for the year. According to the data, there was a 3.4% increase in suicides in 2019 (1,39,123 suicides) compared to 2018 (1,34,516) and 2017 (1,29,887). According to the data, the suicide rate (incidents per 1 lakh population) increased by 0.2% in 2019 over 2018. According to the NCRB, which is part of the Union Home Ministry, the suicide rate in cities (13.9%) was higher in 2019 than the suicide rate in India overall (10.4%). The motivation for creating this initiative is to use emotion to minimize the rising suicide rate.

1.2 Problem Definition

To design system which involves extraction of facial features, and detection of stress using emotions expressed through face using the Convolutional Neural Network (CNN) algorithm and classify positive and negative emotions and detects the stress based on usual threshold value.

1.3 Project Scope

- Useful for emotion detection using facial expressions.
- Easy to maintain system.
- Identify the positive and negative emotions

II. METHODOLOGY

In this project, Face is captured using the camera. This detected face is processed and the emotions are classified as either positive or negative emotions. The detected image is processed to identify the face of the subject using Convolutional Neural Network (CNN) algorithm.

Convolutional Neural Network (CNN):

A Convolutional neural network (CNN) is a neural network that has one or more convolutional layers and are used mainly for image processing, classification, segmentation and also for other auto correlated data. A convolution is essentially sliding a filter over the input. A Convolutional Neural Network (ConvNet/CNN) is a Deep Learning algorithm which can take in an input image, assign importance (learnable weights and biases) to various aspects/objects in the image and be able to differentiate one from the other.

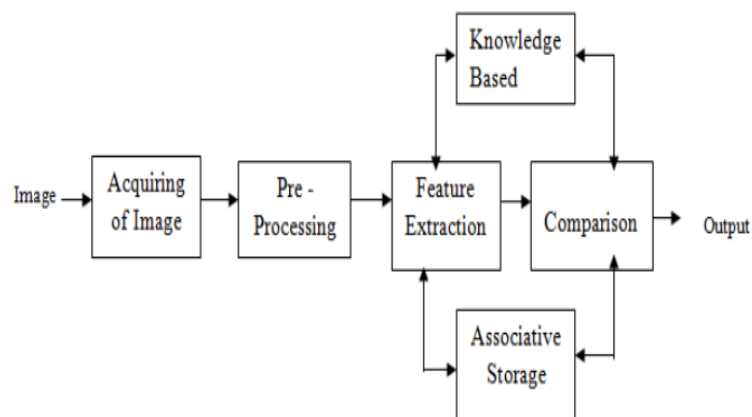


Fig. Methodology Of the system

III. SOFTWARE REQUIREMENTS SPECIFICATION

3.1 ASSUMPTIONS AND DEPENDENCIES

We have assumed the system will recognize emotions of person in photograph. The features are extracted from the image and emotion is detected after that result is produced whether the emotions are positive or negative.

3.2 FUNCTIONAL REQUIREMENTS

The objective behind designing this project is to reduce the increasing suicidal rate and find depressed person using technique of emotion detection.

3.2.1 PERFORMANCE REQUIREMENTS

- The performance of the system must be well.
- The overall performance of the system will enable the users to work efficiently.
- Performance of system should be fast.

3.2.2 SOFTWARE QUALITY ATTRIBUTES

Our software has many quality attributes that are given below: -

- **Adaptability:** This software is adaptable by all users.
- **Availability:** This software is freely available to all users. The availability of the software is easy for everyone.
- **Maintainability:** After the deployment of the project if any error occurs then it can be easily maintained by the software developer.

IV. SYSTEM DESIGN

4.1 System Architecture

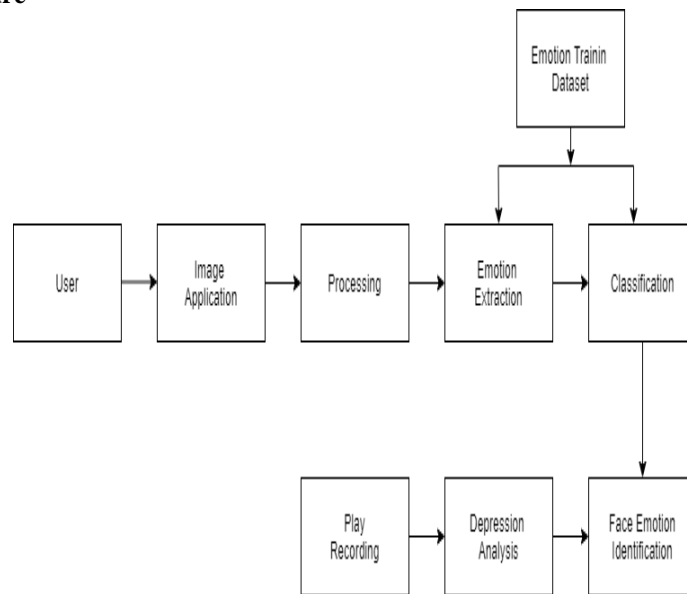


Fig System Architecture

V. APPLICATION

- Having observed that people tend to express their feelings on social media, this type of software integration can lead to early detection of depression.
- If software used explicitly for Depression Detection (without integration on other platforms) then provides a remote service making it easier for people to assess their mental health.
- Will be helpful as Psychiatrist's tool for dealing with patients effectively.

VI. CONCLUSION

The predictor is relatively successful at predicting test data from the same dataset used to train the classifiers. However, the predictor is consistently poor at detecting the expression associated with contempt. This is likely due to a combination of lacking training and test images that clearly exhibit contempt, poor pre-training labelling of data, and the intrinsic difficulty at identifying contempt. The classifier is also not successful at predicting emotions for test data that have expressions that do not clearly belong exclusively to one of the seven basic expressions, as it has not been trained for other expressions. Future work should entail improving the robustness of the classifiers by adding more training images from different datasets, investigating more accurate detection methods that still maintain computational efficiency, and considering the classification of more nuanced and sophisticated expressions.

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