



**IJIRCCCE**

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 11, Issue 3, March 2023

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

**Impact Factor: 8.379**



9940 572 462



6381 907 438



ijircce@gmail.com



www.ijircce.com

# Depression Detection Using Facial Expressions

Prof. Punam V. Chavan<sup>1</sup>, Aishwarya Masne<sup>2</sup>, Sanjana Nadgouda<sup>3</sup>, Tanishq Nagare<sup>4</sup>,  
Namrata Parab<sup>5</sup>

Professor, Department of Information Technology, Zeal College of Engineering and Research, Pune, India<sup>1</sup>

Department of Information Technology, Zeal College of Engineering and Research, Pune, India<sup>2-5</sup>

**ABSTRACT:** According to the World Health Organization, by 2030, depression will be the second leading cause of disability. Depression is a state of mental illness. It is characterized by long lasting feeling of sadness or despair. Most patients with depression do not complain that they are depressed. If a person is sad for a really long time then that person can be considered as depressed person. Such person needs to take the proper diagnosis with the help of psychiatrist. But this people did not like to visit the psychiatrist to check that if they are depressed or not because they fear people's judgments. So this project can help such people to check on their own if they are depressed or not. After checking if that person is sad for most of the time then he/she can be considered as depressed person. After confirming this they can take the proper diagnosis. Depression can be detected by the facial expressions. Deep learning algorithms help us to know about the person's emotion by analyzing their facial expressions. In this paper we proposed a CNN model to analyze the emotion of a person

**KEYWORDS:** Depression detection, Facial Expressions, Convolutional Neural Network.

## I. INTRODUCTION

One of the growing mental health problems that many members of the younger generation are experiencing is depression. Depression is being caused by the work culture, demanding lifestyle, emotional imbalance, family issues, and social life. Depression is becoming a common and serious illness, and it has a negative impact on how a person goes about their daily life. Usually this state of mind causes sadness, loss of interest in things and work, and can lead to suicide. It affects natural functioning both at work and at home.

The main symptoms of depression are changes in eating and sleeping habits, loss of energy, inability to concentrate, anxiety, hopelessness, feeling of little use, thoughts of self-harm etc., and main consequences are weight and loss, heart disease, inflammation, sexual health problems, chronic health problems, etc. In this research, we will facial expression detection model to examine users' feelings. CNNs are a particular kind of neural network that differs from other neural networks in its convolutional layer. In order to classify images, CNN analyses each pixel matrix's corner, vector, and dimension. Three processes make up the standard method for recognizing facial emotions: face detection and tracking, feature extraction, and expression classification.

## II. PROBLEM STATEMENT

With the development of technology, mental stress is increasing more and more, which is mainly influenced by emotions. That is why we use the machine to get the right emotional state because it cannot be affected by external factors. . We can analyze everyone's emotions by observing their facial expressions



**III. LITERATURE SURVEY**

Title	Author	Publication	Summary
Facial Emotion Detection using Machine Learning	Raut Nitisha	Spring 2018	The main goal of the work discussed in the thesis is to make the detection of depression through speech more feasible in terms of time and resources.
A comprehensive study of facial emotion detection techniques	RenukaDeshmukh, VandanaJagtap	IJCSIS	In this paper, they recognized facial expressions from images in the JAFFE database.
Facial Emotion Detection using Deep Learning	AkritiJaiswal, A.Krishnama Raju, Suman Deb	INCET	In this paper, they proposed a method based on deep learning to detect facial emotions from an image.
Real-time acoustic depression detection using machine learning techniques	BhanushreeYalamanchili, Nikhil Sai Kota, MaruthiSakethAbbaraju, Venkata Sai Sathwik Nadella, Sandeep Varma Alluri	Ic-ETITE	The main goal of this article is to make the detection of depression through speech more feasible in terms of time and resources.
A Machine Learning based	Swati Jain, Prakash Narayan, Rupesh	SCES	In this paper, they proposed a depression



Depression Analysis and Suicidal Ideation system using Questionnaires and Twitter.	Kumar Dewang, UtkarshBhartiya, NaliniMeena, Varun Kumar	analysis and suicidal ideation detection system to predict suicidal acts based on the level of depression. They collected real-time data from students and parents by having them fill out questionnaires such as the PHQ-9.
------------------------------------------------------------------------------------	------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

#### IV. METHODOLOGY

The dataset for this study consists of hundreds of images with both male and female faces expressing different emotions. The methodology of this project focuses on creating a CNN model that filters unnecessary information from the input and expresses facial expressions through the output.

#### 4.1 ALGORITHM:

##### 4.1.1 CNN:

CNN uses spatial correlations between the input data and itself. A number of input neurons are connected between each simultaneous layer of the neural network. Hidden neurons are the focus of the local receptive field.

CNN is a type of network architecture for deep learning algorithms used for image recognition and other tasks that require pixel data processing. There are other neural networks in deep learning, but CNNs are the main network architecture for object detection and recognition.

##### 4.2 Haar Cascade Model:

Face recognition, a widespread topic with many applications. Modern smartphones and laptops have built-in facial recognition software that can authenticate the user's identity. There are tons of apps that can capture, detect, and process faces in real time, detect a user's age and gender, and apply really cool filters. Haar Cascade is an object detection algorithm used to detect a face in an image or live video. The algorithm uses edge or line detection features proposed by Viola and Jones in their 2001 study "Rapid Object Detection using a Boosted Cascade of Simple Features". The algorithm receives many positive images that consist of faces and many negative images that do not consist of faces to train.

Haar Cascade is a feature-based object detection algorithm for detecting objects in images. The cascade function is trained to detect many positive and negative images. The algorithm does not require extensive computation and can run in real time.

#### 4.3 UML DIAGRAM:

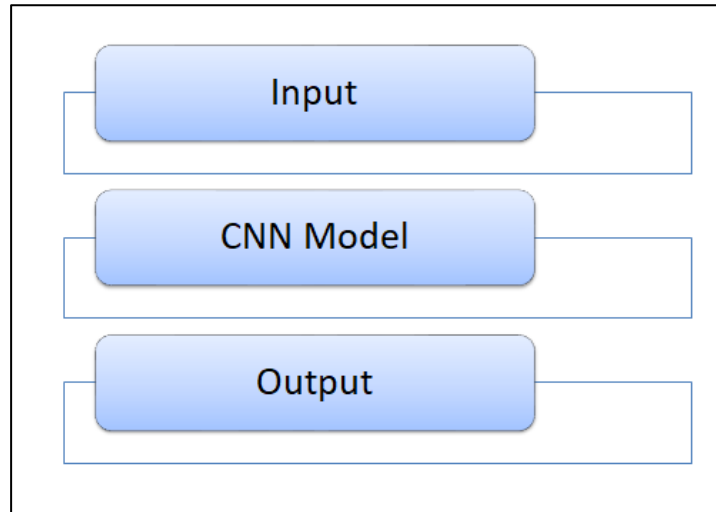


Fig: UML Diagram

#### 4.4 SYSTEM ARCHITECTURE:

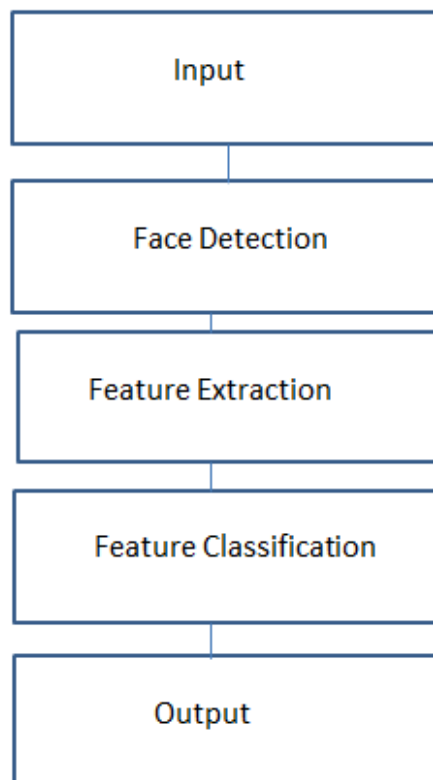


Fig 2: System Architecture



## V. CONCLUSION

We analyze our proposed model using trained and tested sample images and evaluate their performance against the previous existing model. The experimental results will show that the proposed model is better than the models described in the previous literature in emotion recognition results. The experiment shows that the proposed model produces high-level effects on the datasets.

## REFERENCES

- [1] W. H. Organization et al., "The Global Burden of Haiges: 2004 update", 2008.
- [2] C. D. Mathers and D. Loncar, "Projections of Global mortality and burden of disease from 2002 to 2030," PLoS medicine, voi. 3, hey. 11, s. e2,2006.
- [3] Cummins N, Scherer S, Krajewski J, Schnieder S, J Epps, and T. F. Quatieri, "A review of depression and suicidality risk assessment using speech analysis," Speech Communication, vol. 71, pp. 10–9, 2015
- [4] M. Valstar, J. Gratch, B. Schuller, F. Ringeval, D. Lalanne, M. Torres Torres, S. Scherer, G. Stratou, R. Cowie, and M. Pantic, "Avec2016: Depression, mood, and emotion recognition workshop and challenge," in Proceedings of the 6th International Workshop on Audio/Visual Emotion Challenge, ser. AVEC '16. New York, NY, USA: ACM, 2016, pp. 3–10. [Online].
- [5] N. Cummins, J. Epps, M. Breakspear, and R. Goecke, "An investigation of depressed speech detection: Features and normalization," in Twelfth Annual Conference of the International Speech Communication Association, 2011.
- [6] H. Jiang, B. Hu, Z. Liu, L. Yan, T. Wang, F. Liu, H. Kang, and X. Li, "Exploring different speech types and emotions for depression detection with different classifiers", Speech Communication, vol 90, pp 39-6, 2017.



**INNO**  **SPACE**  
SJIF Scientific Journal Impact Factor  
**Impact Factor: 8.379**



**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
**INDIA**



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

 **9940 572 462**  **6381 907 438**  **ijircce@gmail.com**



[www.ijircce.com](http://www.ijircce.com)

Scan to save the contact details