



PYTHON-BASED MACHINE LEARNING SYSTEM FOR DETECTING DEPRESSION USING ALGORITHMS

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Abstract :

Stress, depression, and other mental health issues are increasing worldwide, affecting all ages. In response, a new program employs machine learning to find and study the origins of mental health concerns like stress, anxiety, and depression. In terms of precision and efficacy, the research incorporates a number of machine learning techniques that transcend more traditional methodologies. The data was collected from numerous social media sites using machine learning to identify early signs of serious depressive disorder. The datasets were fully analyzed to understand mental health patients' behavior. We found mental health issues' causes using facial expression, gesture, speech, and text analysis. We also used hand gestures, lip, nose, and eye movements to identify emotional states like anger, happiness, grief, and neutrality. This was done using an image and video processing emotion identification system. Our program focuses on early mental health diagnosis and treatment to assist consumers get the right help. Machine learning enhances how well mental health illnesses are diagnosed, allowing people to take the necessary actions to improve their mental health.

IndexTerms- Supervised machine learning, medical science, Naïve biased, CNN, Image processing

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1. INTRODUCTION

Stress is a key cause of mental health disorders in all ages. One in fifteen persons have a mental health issue, according to studies. Mental illness symptoms include loss of interest, fatigue, remorse, difficulty concentrating, low self-esteem, social withdrawal, and speech slurring. Untreated mental health conditions can cause physical pain, sleep disturbances, and weight difficulties. Studies have linked depression to cardiovascular disease, and untreated depression increases the chance of heart attack death. Unfortunately, many persons with mental illnesses do not seek professional help, increasing their risk of self-harm and suicide. A 2003 poll indicated that severe depression reduced productivity, demonstrating its negative effects on work performance. To address these concerns, we propose a software application that uses Convolutional Neural Networks (CNN), supervised machine learning, and naive biased algorithms to identify depression and its causes. The proposed application uses user input to personalize recommendations and solutions, solving the problem. Machine learning may help diagnose and treat depression and other mental health issues. This program may enable those who are hesitant to talk about their issues get help in a secure and confidential

environment. This app could enhance many people's mental health and benefit society.

2. LITERATURE REVIEW

Machine Learning-based Approach for Depression Detection in Twitter Using Content and Activity Features:-

This article examines tweets and network activity to determine depression. This system could detect other mental disorders and form the basis for new social network depression detection and prevention methods. Over 300,000 tweets and 111 user profiles are examined in this study. Support vector machine (SVM)-linear classifier algorithms perform best for depression severity assessment, with an accuracy of 82.5 and an F-measure of 0.70. The following sections are organized: Section 1 reviews the literature. The scientific basis for the studies' classifiers is covered in the second part. The third portion addresses the study methodology and retrieved and computed features. Section 4 details the experiments and analyzes the outcomes. Section 5 provides a detailed summary of the study's findings.

Analysis of Deep Learning Techniques for Early Detection of Depression on Social Media Network– Machine learning methods classify unique traits and



probable patterns. Social media users feel joy, sadness, rage, worry, and depression. Depressive condition and anxiety often cause serious problems. Depressive diseases share anxiety and depression symptoms. Depression type affects social media posts, discussions, and expression. By measuring depression intensity and indicators, cardiovascular disease patients can be screened for suicide risk. Apprehensive depression symptoms are divided into numerous categories and explain its causes. In today's world, social media lets people keep in touch and share their opinions.

Automatic Assessment of Depression Based on Visual Cues: AS ystematic Review:-

This paper provides a thorough overview of automated depression detection and severity assessment methods. This study examines image processing and machine learning algorithms using visual cues. The purpose is to remedy the sector's lack of comprehensive reviews. This paper examines automated depression analysis methods that may help doctors detect and track depression. The main concerns are (a) the potential of video-based depression assessment to aid diagnosis and monitoring, and (b) the sufficiency of visual signals in isolation versus the need to supplement them with other modalities. Current methodologies are examined for their pros and cons in this study. Quantitative analysis summarizes the state of the art.

Depression detection using machine learning:-

This paper describes machine learning, a computer method that leverages historical data to gain knowledge and optimize performance in comparable scenarios. Multiple factors, including user emotion, are examined. Mental illness often begins with depression. This trait increases suicidal ideation and makes daily life harder. Machine learning may help identify depression and develop therapies.

3. MOTIVATION

The software aims to help anxiety and depression sufferers. Untreated mental illnesses can lead to suicide, thus the goal is to decrease their harm. This goal was achieved using modern technology like CNNs, supervised machine learning, and the Nave Bayes Classifier. The experiment shows how tailoring an idea to individual needs may work. After reviewing volunteer feedback, the project team will update the text and speech models. The program aims to increase accessibility while protecting user data during transmission. For those in need, the app gives a complete guidance to processes and activities. Another feature in development will update users' mental health condition frequently. The user will supply the contact information for the healthcare

practitioner who will get these reports. The project's main purpose is to encourage people to seek help and discourage excessive self-harm. The program helps mental health patients manage their issues. The team believes that leveraging technology to improve mental health interventions will expand access and help.

4. PROBLEM STATEMENT

Technological advances allow machine learning to assess and identify depression in individuals. The widespread prevalence of tension, anxiety, and fast-paced lifestyles has negative mental health effects. Healthcare technology has enabled the digitalization and precise mapping of massive volumes of human biological data, surpassing old measuring methods. Data analysis and depression detection using machine learning. To find the causes of sadness, computers are trained using facial expressions, gestures, speech, and text analysis. These inputs let the system distinguish between a person's anger, happiness, grief, and neutrality.

5. OBJECTIVES

- No information is in the user's text. This study aims to detect melancholy in two methods. Image and video processing techniques are used to recognize facial expressions and emotions in the first method. Emotion identification can help assess depression severity.
- The second method uses system-posed questions to assess the user's depression. Machine learning algorithms assess user responses to mental and emotional health questions to determine depression severity.
- This research uses modern machine learning to produce a reliable and effective method for early depression detection and identification, reducing mental health burdens on individuals and society.

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6. SYSTEM ARCHITECTURE



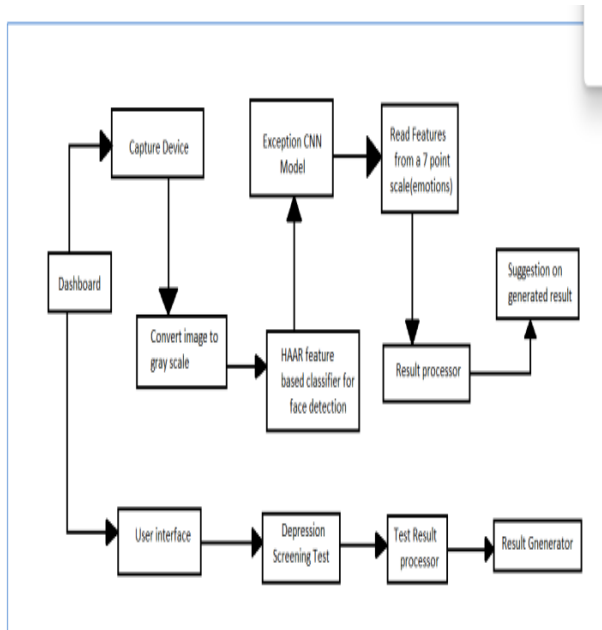


Fig.Style of architecture

7. PROJECT SCOPE

- Across the world. Thus, methods and systems that identify and solve these issues are in high demand. We want to apply machine learning to detect early indicators of emotional issues, especially depression, in adolescents.
- Combining facial expressions, audio, and text analysis could create a system that accurately assesses emotional state.
- This technique helps people obtain timely care and prevent mental health issues from escalating. Early detection of mental health issues can reduce their impact and speed up treatment.

8. PROPOSED SYSTEM

We present a Python-based depression detection system to assess user depression. Face recognition technology helps the system detect melancholy faster by analyzing facial expressions. Early depression detection helps people understand the disorder and apply appropriate treatments. Early detection of this condition reduces depression risk.

Framework

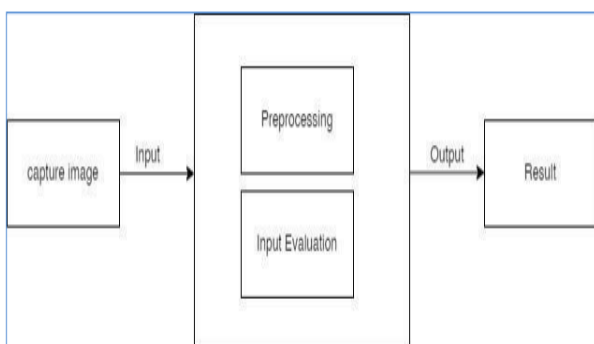


Fig.Framework

9. PURPOSES OF DEPRESSION DETECTION

- Depression detection identifies sad persons and provides them with treatment.
- Depression can impair daily life, job, and relationships.
- Early detection and treatment can greatly improve depression prognoses.
- We can use machine learning algorithms to detect depression in people by measuring facial expressions, speech patterns, and question responses.
- This lets doctors treat depressed patients quickly and effectively, possibly preventing self-harm or suicide.

10. RESULT:

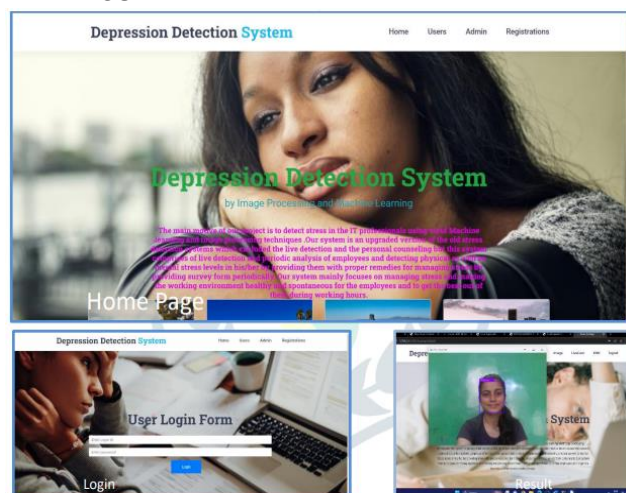


Fig.Output

After logging in, users can fill out their profile on their dashboard, as shown above. Melancholy is calculated utilizing system criteria.

11. CONCLUSION

Depression is a serious mental condition that can be hard to diagnose and affects everyone. Depression can make people feel lonely and unwilling to express themselves or seek help. Depression may go undiagnosed and untreated, which is harmful to mental health and well-being. Melancholy can be detected and analyzed using cutting-edge technologies like sentiment analysis, facial expression analysis, and others. These techniques detect depressive speech, facial gestures, and other behaviors. The hybrid system detects and diagnoses melancholy well. Text-, image-, and video-processing approaches have been found to detect emotions and depression. This approach assesses depression severity and gives assistance, unlike medication-based treatments. Finally, depression is a major global mental illness. Modern technology like sentiment analysis and facial recognition may diagnose and evaluate depression, helping people overcome it. This



hybrid system could help identify and treat depression and reduce its impact on society and people.

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