

# Depression Detection System

<sup>1</sup>V. Jyothi (Assistant Professor)  
<sup>2</sup>Khyati S Desai  
<sup>3</sup>T Nihal Reddy  
<sup>4</sup>V Lakshmi Sruthi  
 Department of CSE  
 Anurag Group of Institutions

**Abstract:-** The majority of people deal with depression on a daily basis, which is a prevalent and serious mental illness. Depression has an impact on a person's physical, psychological, and mental health in addition to their emotional state. In contrast to other illnesses, depression cannot be diagnosed through laboratory testing, goes unnoticed due to a lack of knowledge and awareness, and can deteriorate to the point of suicide. Physicians are currently using self-reported questionnaires and in-person interactions as part of their diagnostic process for identifying depression. A psychiatric evaluation of social interactions and human behaviour is required for the diagnosis of depression. The patient's audio and video recordings show how people with depression behave differently than average people do. The user and the admin are the two different user categories that can interact with the application. The user has two choices: the PHQ-9 exam or an evaluation that consists of three components—a questionnaire, a video, and an audio detection, each weighted at 33% and used to determine the user's level of depression. The findings are also used to suggest treatment alternatives. In order to combat the condition sooner, computer vision and machine learning have been employed to diagnose depression.

## I. INTRODUCTION

Millions of people all over the world suffer from depression, which is a common mental health disorder. Unfortunately, due to obstacles like stigma, limited access to mental health professionals, and a lack of resources, many people do not receive timely diagnoses and treatments. Depression can therefore have a significant effect on a person's quality of life and raise the risk of suicide. To solve this problem, scientists and programmers have been developing depression detection systems that use machine learning and artificial intelligence to identify people who may be at risk for depression. These systems can examine a variety of data sources, including social media activity, speech patterns, and physiological signals, to identify depressive symptoms and give individuals, their families, and medical professionals early warning. The goal of this project is to create a depression detection system that can correctly identify people who might be depressed. To provide a more thorough and precise evaluation of a person's mental health status, the system will make use of a variety of data sources and cutting-edge machine learning techniques. This system could enhance mental health outcomes and lessen the effects of depression on individuals, families, and society by

facilitating prompt intervention and early warning.

### ➤ Existing System

The existing mental health system focuses only on unimodal development of a person's mental health, and few systems use only PHQ-9 tests, resulting in inadequate treatment and misdiagnosis. A more comprehensive system is needed, using accurate tools to evaluate all aspects of a person's mental health, leading to personalized and effective treatment plans that can improve the quality of life for people living with depression.

### ➤ Proposed System

The proposed application has two user categories: user and admin. Users can take the PHQ-9 test to evaluate their mental health or choose a more comprehensive assessment with a questionnaire, video, and audio detection. Based on the results, the system can suggest treatment options for the user's level of depression. Admins have access to all assessment reports to track user progress over time. This system aims to improve mental health care quality and provide personalized support for those living with depression.

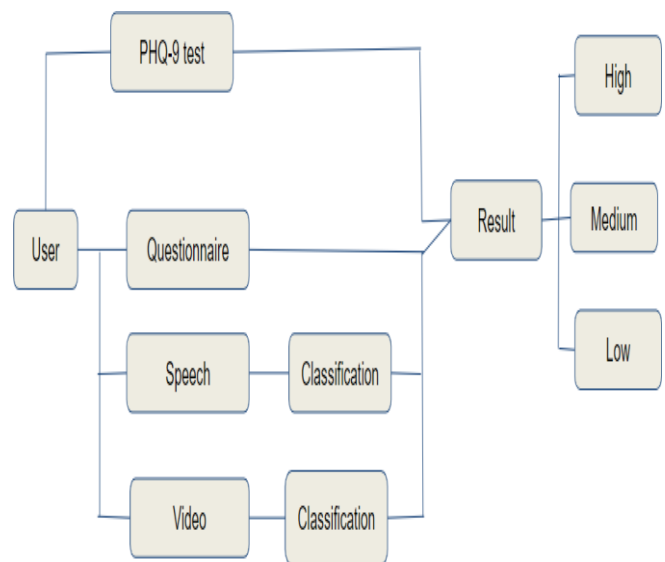


Fig 1 Proposed System Architecture

## II. EXPERIMENTAL TOOLS

### ➤ Visual Studio Code

Microsoft created the well-known open-source code editor known as Visual Studio Code (VS Code). For writing and debugging code, developers and programmers use it frequently. The popularity of VS Code among developers is largely due to its many features, which include code highlighting, autocomplete, and debugging tools. Numerous programming languages, such as Java, Python, JavaScript, C++, and others are supported.

### ➤ Opencv

A sizable open-source library for image processing, machine learning, and computer vision is called OpenCV. Python, C++, and Java are just a few of the many programming languages that OpenCV is compatible with. In order to identify objects, faces, and even human handwriting, it can analyze images and videos. The number of weapons in your arsenal increases when OpenCV is combined with other libraries, such as NumPy, a highly optimized library for numerical operations, because any operation that can be done in NumPy can also be merged with OpenCV.

### ➤ Django

The rapid development of trustworthy websites is made possible by the high-level Python web platform known as Django. Django, which was created by seasoned programmers, handles a lot of the hassle associated with web development, allowing you to concentrate on writing your app without having to invent the wheel. It is open source and free, has a thriving community, excellent documentation, and a variety of free and paid support

options.

### ➤ Tensorflow

TensorFlow is an open-source library for large-scale machine learning and numerical computation that makes it easier for Google Brain TensorFlow to gather data, train models, deliver predictions, and improve future outcomes. Machine learning and deep learning models and algorithms are bundled together by TensorFlow. Python is used as a practical front-end.

### ➤ NLTK

NLTK (Natural Language Toolkit) is the favored Python API for natural language processing. To prepare text data for further analysis, such as with ML models, it is a very potent tool. It assists in turning text into numbers, which the model can use to its advantage.

### ➤ Moviepy

It is a Python package for video editing that can be used with straightforward operations (like cuts, concatenations, and title insertions), video processing, non-linear video compositing or sophisticated effects. The bulk of widely used video formats, including GIF, can be read and written.

### ➤ Textblob

A Python (2 and 3) library called TextBlob is used to process textual data. It offers a straightforward API for getting started with typical natural language processing (NLP) tasks like part-of-speech tagging, noun phrase extraction, sentiment analysis, classification, translation, and others.

### ➤ Output

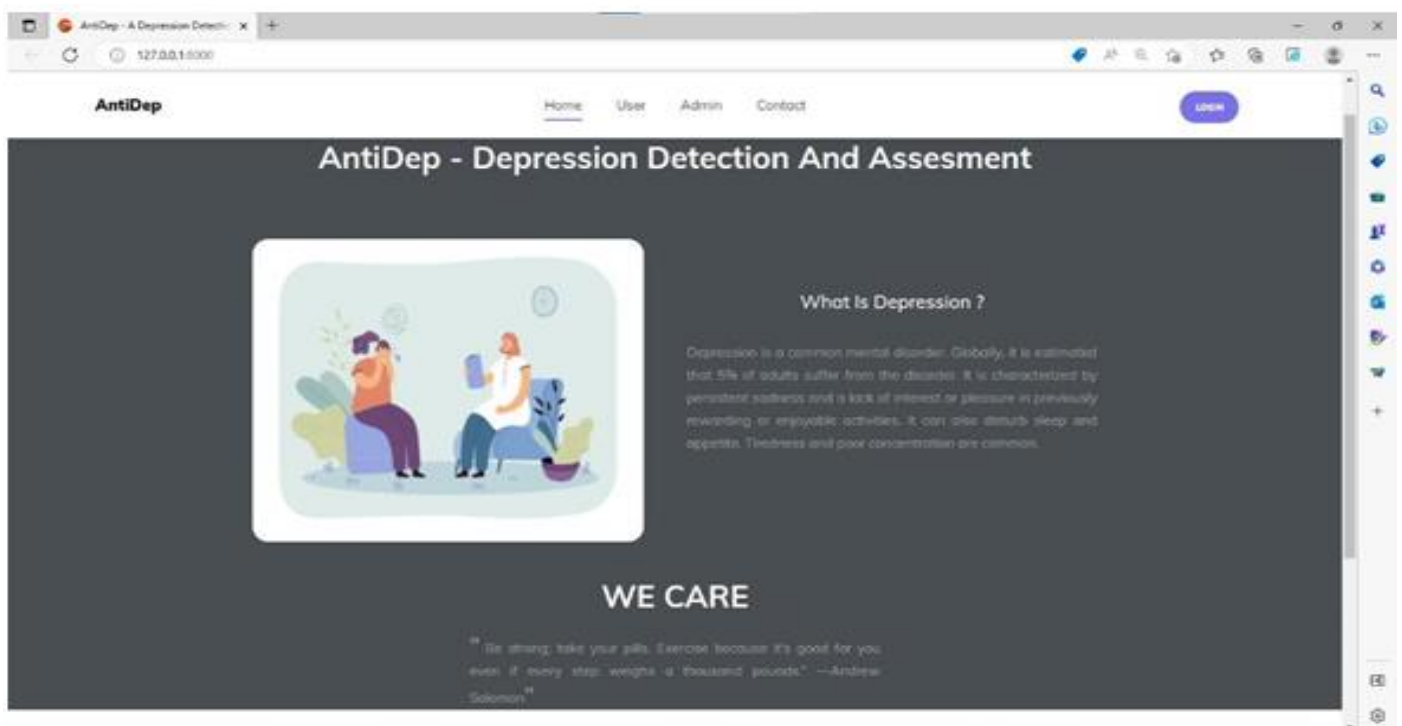


Fig 2 User Interface

It displays the user's home page, where they can register if it's their first time, log in, and also login as an administrator.

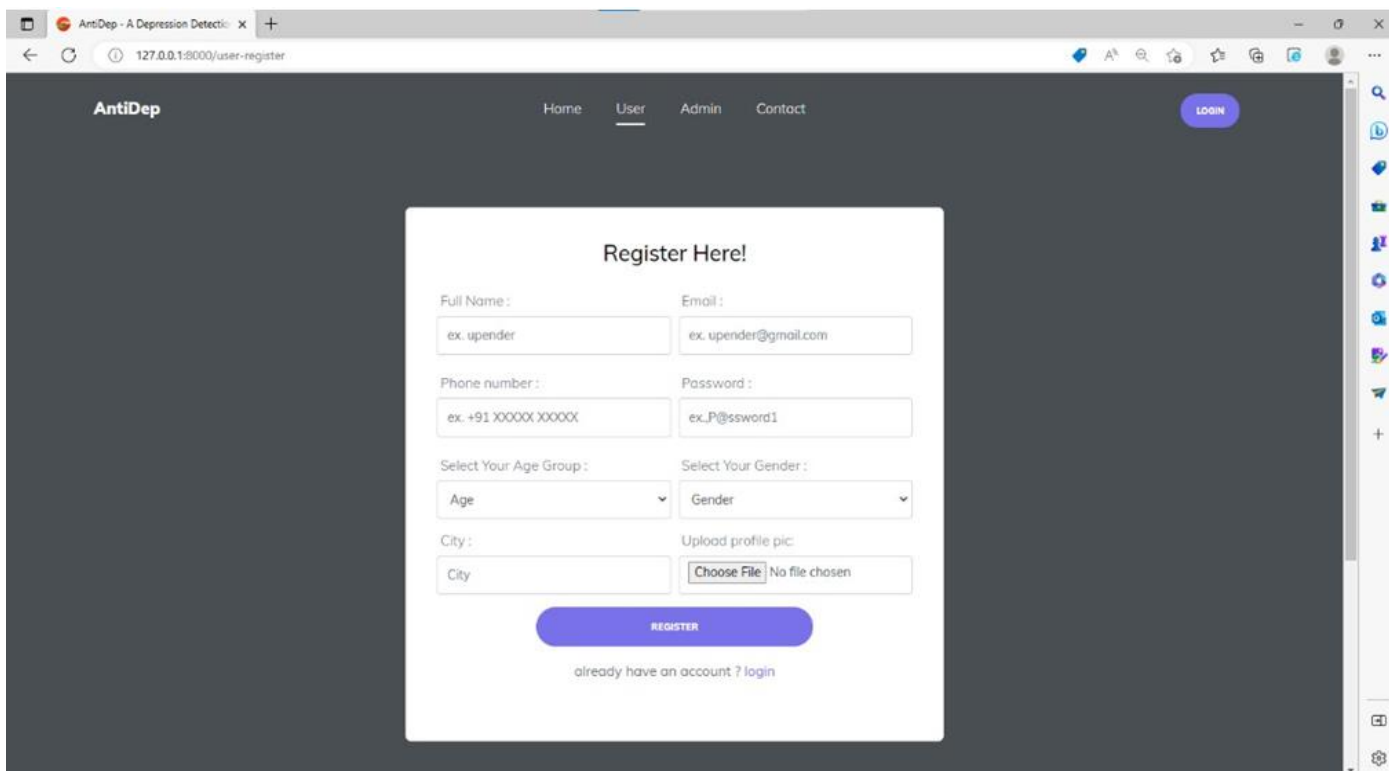


Fig 3 Registration Page

The age field on the registration page is the most crucial one because the questions will be displayed according to the age group.

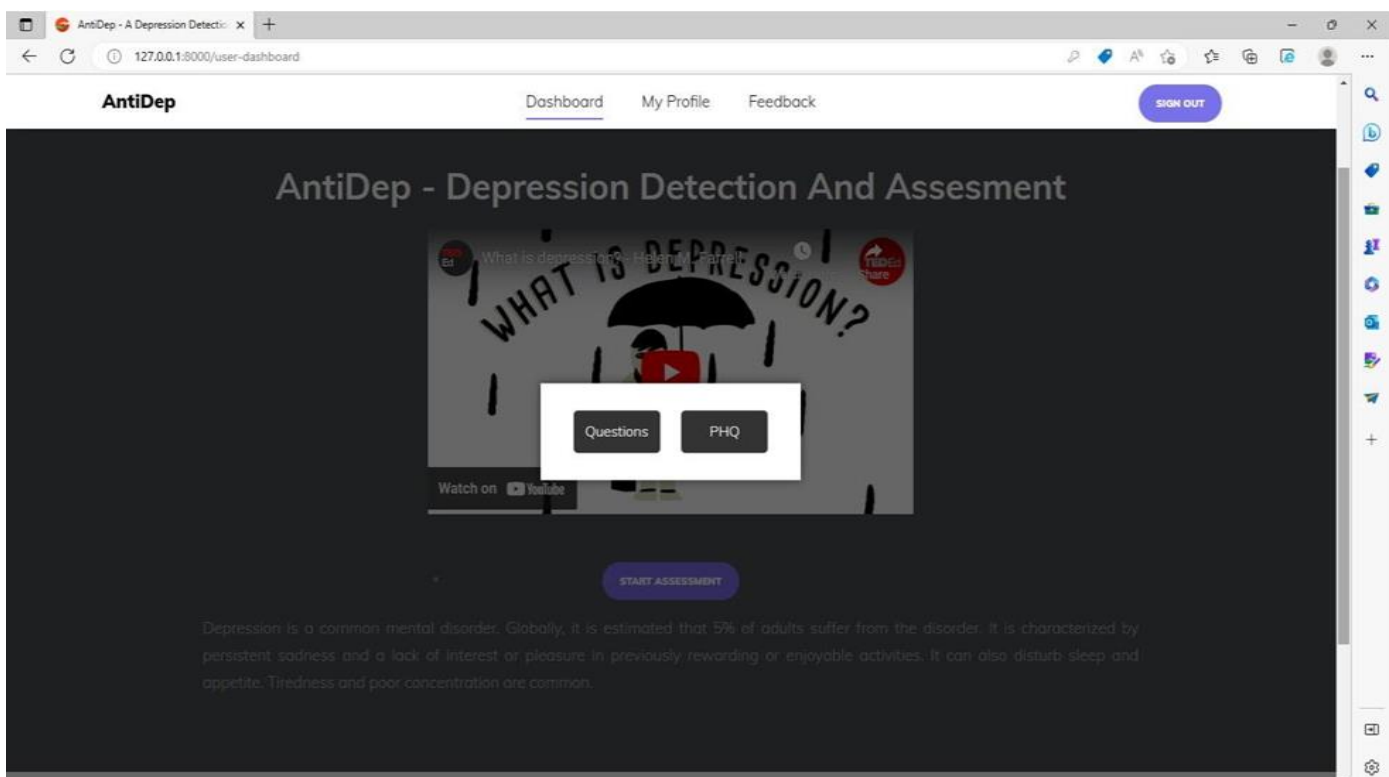


Fig 4 Selection Page

The user is given the choice on this page between the PHQ-9, a self-analysis tool, and an evaluation that comprises of a questionnaire and an audio/video detection.

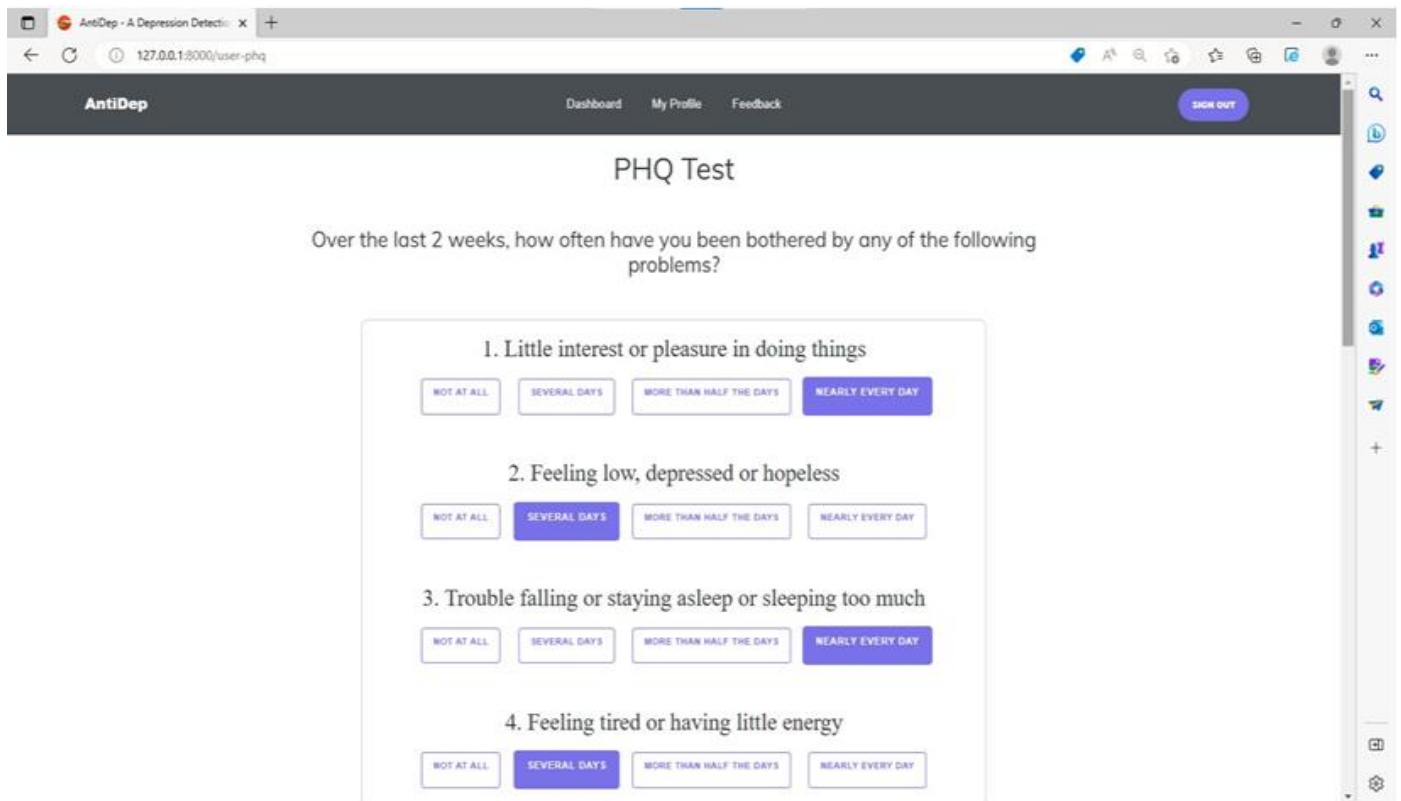


Fig 5 PHQ-9 Test

All age groups take the same 9 questions on the test, and each question is worth a certain number of points. Results include the overall score, the level of depression, and a suggestion.

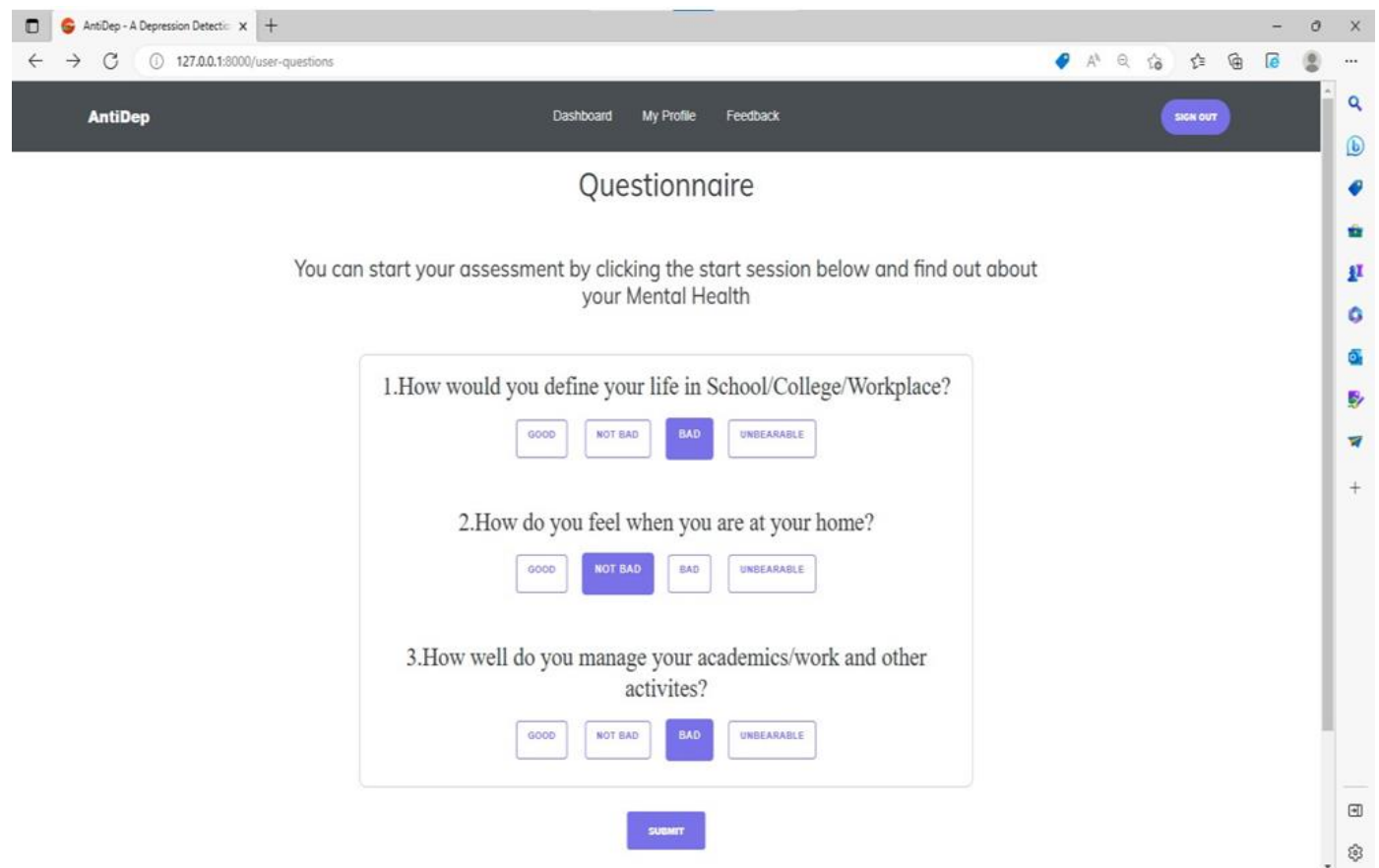


Fig 6 Questionnaire the Above Questionnaire Changes According to Age Groups

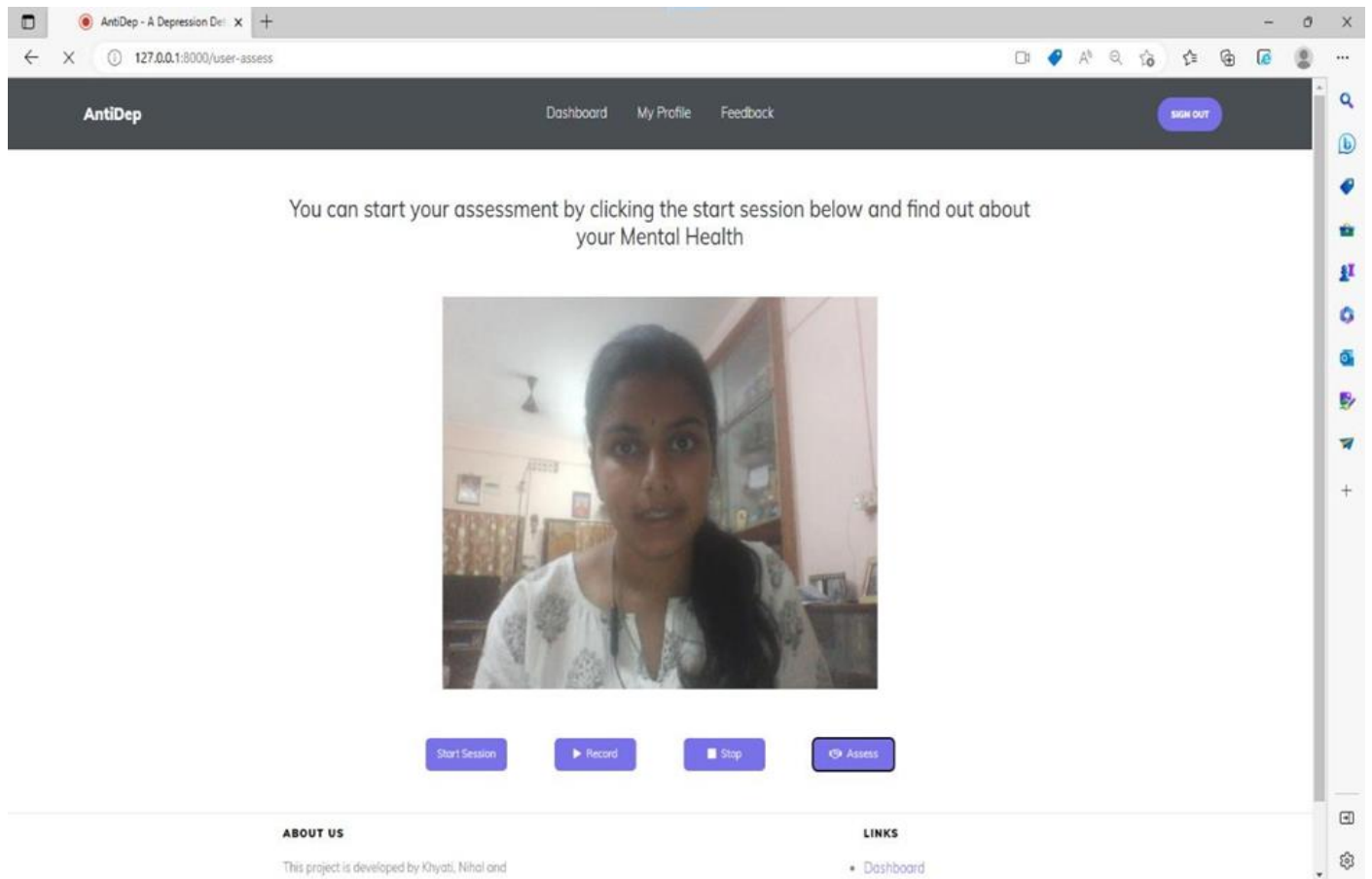


Fig 7 Audio/Video Detetction Session will be Started and the Audio/Video will be Detected

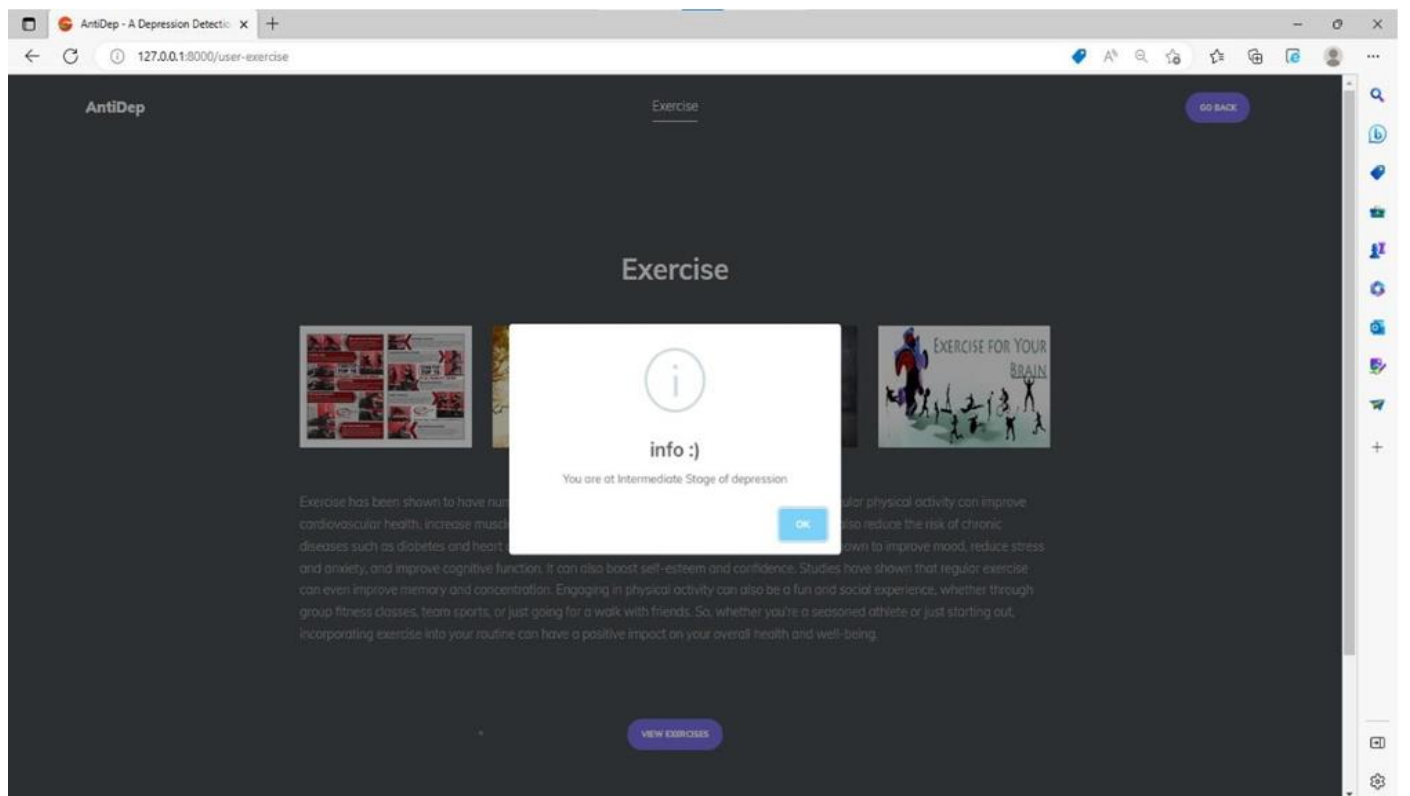


Fig 8 Depression Level Detection

Based on the questionnaire and audio/video session, the severity of depression is determined.

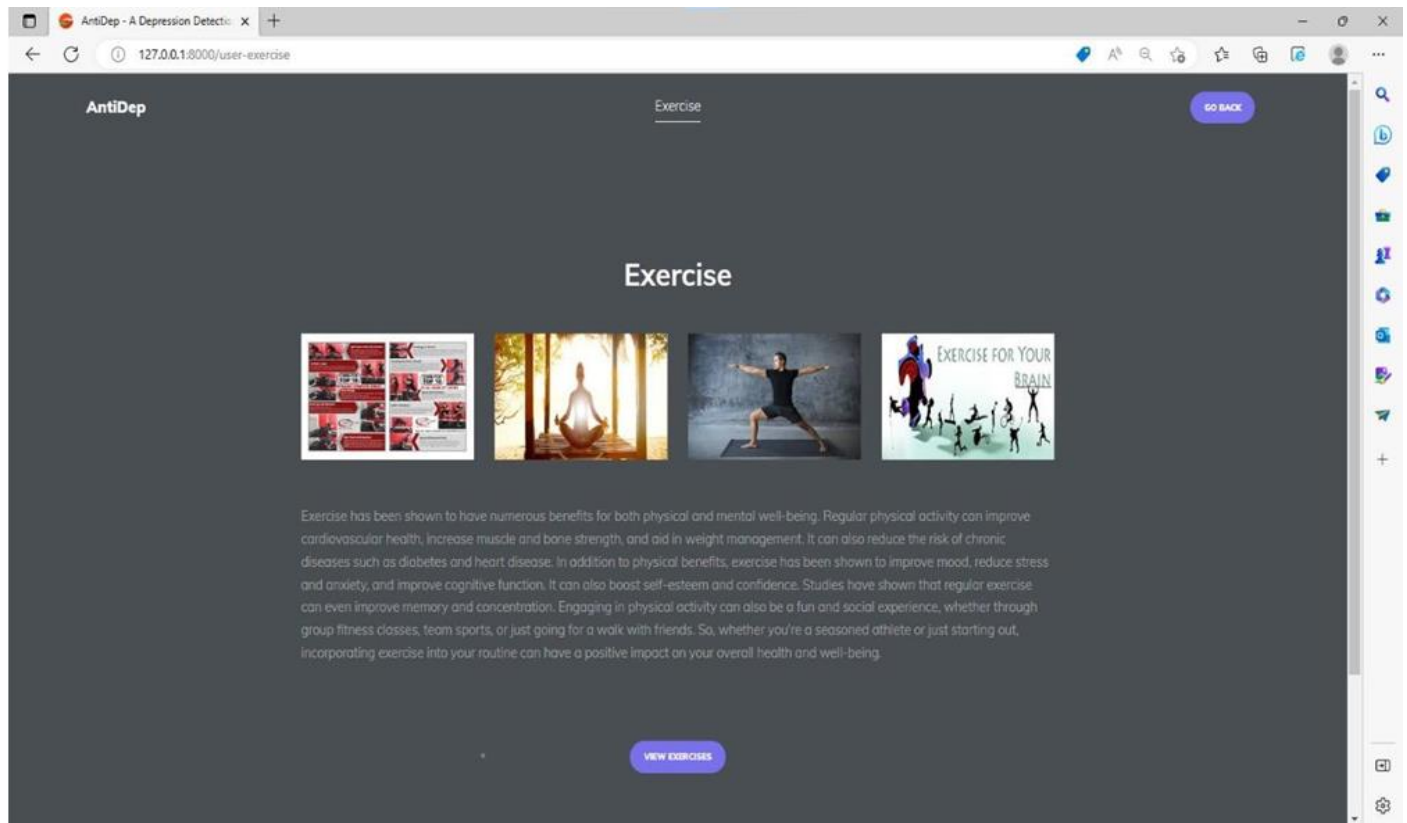


Fig 9 Recommendation

Suggestions are displayed based on the severity of the depression i.e games, exercises or nearby psychiatrist.

### III. CONCLUSION

In conclusion, depression is a complex and serious mental health issue that affects a significant number of people worldwide. While it cannot be diagnosed through laboratory tests, innovative solutions are being developed to improve the accuracy and effectiveness of the diagnostic process. The use of audio and video recordings, along with self-reported questionnaires, can provide a more comprehensive assessment of a patient's mental state. The development of an application that uses computer vision and machine learning to identify depression has the potential to revolutionize the way we diagnose and treat this condition. By detecting depression early on, patients can receive the appropriate treatment and support, improving their chances of recovery and reducing the risk of suicide. The findings of this research offer hope for those struggling with depression and highlight the importance of continued efforts to improve mental health diagnosis and treatment.

### REFERENCES

- [1] What reveals about depression level? Role of multi-modal features at the level of interview questions
- [2] Using partial least square regression, depression can be identified based on dynamic vocal and facial expression features
- [3] A systematic review of an automated test for psychiatric disorders using speech
- [4] Deep learning for recognizing depression
- [5] Automatic depression level analysis using visual expressions by Artificial Intelligence
- [6] Adolescents' speech during family interactions can be examined for signs of depression
- [7] System of multi-channel weighted speech classification for teenagers' major depression prediction
- [8] A comparison of read and spontaneous speech for the purpose of detecting depression
- [9] A study of acoustic characteristics for depression detection
- [10] An effective deep model for audio-based depression classification is DE AudioNet
- [11] Analysis of eye movement to identify depression in teenagers
- [12] Teenage depression detection using facial features
- [13] A Comprehensive Review of Effective Methods for Depression Detection on Social Media
- [14] Determining depression using eye flutter characteristics
- [15] Movement of related body parts for automated depression analysis