REPORT

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Paper Title :

Machine Learning based Classification Model for Depression Detection

1 Summary

The average age of humans is increasing all throughout the world. The proportion of the world's population that is aged 60 and above is rising. This is the case for emerging countries as well as industrialized ones. In the year 2000, there were 607 million persons over the age of 60 living around the world; however, by the year 2015, that number had increased to 901 million. [1] The United Nations projects that by the year 2050, the global population will have grown by 2.1 billion, reaching a total of 3.1 billion people. According to the World Health Organization (WHO), a person is considered to be healthy if they are both physically fit and mentally sound.

Depression is the worst kind of mood disorder because it affects so many areas of life and can be hard to deal with. Machine learning models have helped the field of mood detection in all kinds of data, such as text, images, and audio files. The goal is to create a machine learning-based model that can be used to figure out how depressed people are. The person will be put into one of the following depression categories based on the traits that were looked at Mild, Moderate, Severe, and Extremely Severe.

1.1 Motivation

The provision of high-quality treatment at affordable prices is one of the most significant challenges that mental healthcare organizations must face today. Because of the prohibitively expensive nature of therapy, the majority of individuals in Bangladesh do not give their mental health state any thought at this point in time. Occasionally, all they do is go to the doctor, but since checkups are so expensive, they don't take them too seriously. In such instances, they do not have any information about their genuine mental health. People in Bangladesh may also be incredibly sluggish about their day-to-day checks, which is one of the reasons why they might develop severe mental health problems without ever realizing it. Laziness and the high expense of therapy are the two main reasons why people disregard their mental disorders. After seeing a situation of this kind, we were motivated to design a system that would provide an expedited method for determining whether or not a person is depressed.

1.2 Contribution

Both of the papers work on depression using various datasets. Five machine learning algorithms are used and the 2nd paper uses BDI-II inventory using the web application. The videos converted into frames are proffered to a neural network model for face detection. The output is passed to a trained CNN model for feature extraction, classification generating an output of emotion vector.

1.3 Methodology

This [1] research focused on detecting anxiety, depression, and stress using the Depression, Anxiety, and Stress Scale questionnaire (DASS 21). Data were collected from a total of 348 participants via Google Forms and subsequently classified using five machine learning algorithms – namely Decision Tree, Random Forest Tree, Naïve Bayes, Support Vector Machine, and KNN. This study was conducted on a total of 348 participants aged between 20

and 60 years, both males and females, employed and unemployed and with a wide range of responsibilities from household chores to professional duties who were asked to complete a questionnaire.

The second paper [2] followed in this approach includes preprocessing, feature extraction, depression detection: classification, correlation and result analysis. The user is allowed to input video and solve the BDI-II inventory using the web application. The videos converted into frames are proffered to a neural network model for face detection. The output is passed to a trained CNN model for feature extraction, classification generating an output of emotion vector.
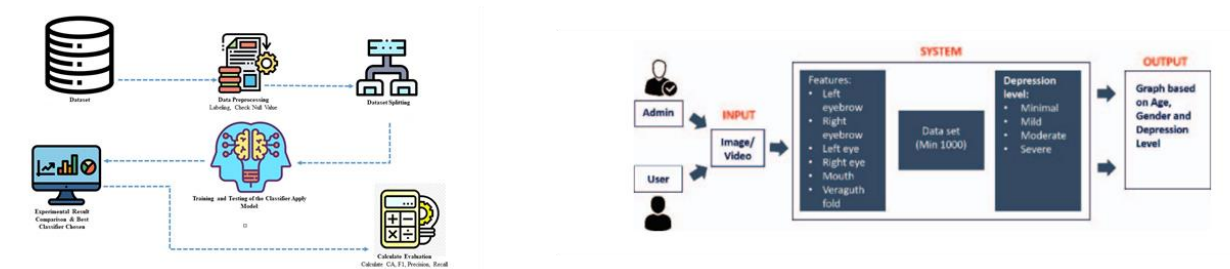

Figure: Papers 1 & 2

1.4 Conclusion

In this paper [1], machine learning algorithms were applied to determine five different severity levels of anxiety, depression, and stress. Data were collected using a standard questionnaire measuring the common symptoms of anxiety, depression, and stress (DASS-21). Subsequently, five different classification techniques were applied – Decision Tree (DT), Random Forest Tree (RFT), Naïve Bayes, Support Vector Machine (SVM), and K- Nearest Neighbour (KNN).

This paper [2] presents an approach for depression detection, supporting the association of countenance and geometry with BDI-II inventory. The key idea is to develop a video-based decision network system that can detect the depression of the user.

2 Limitations

2.1 First Limitation

Paper [1] uses very small datasets, it's not enough & and Paper [2] uses datasets from Kaggle.

2.2 Second Limitation

If more classifiers are used on both papers we can get more accurate results.

3 Synthesis

In the future we will make more efforts to collect data and focus on adding more layers of categorization to datasets, it may be possible to get a bigger and more reliable set of data that we may use in future additional classifiers and data mining algorithms to a larger dataset, or get a deeper understanding of people's mental health so that we may better assist them or refer them to a psychologist. Finally, we can promise that in the future, we will keep at it until this is the greatest job possible and we will build a website that makes it easy to spot signs of depression. The ability of a machine learning model to spot signs of depression could help people from all walks of life.