

SENTIMENTAL ANALYSIS USING MACHINE LEARNING

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Abstract - Early discovery of mental health concerns by professionals can aid in more successful diagnosis and treatment of individuals. This article explores the state of artificial intelligence (AI) in the realm of mental health and possible uses in medical treatment. Anxiety and sadness are two common mental health conditions that can be helped by machine learning approaches. They are also able to identify trends and offer practical solutions for solving the issues. Feature Selection techniques have been used to decrease the attribute data. The accuracy of several machine learning methods has been examined for both the complete set of attributes and a subset of attributes. Despite the study of a number of algorithms, more effort is still required to close the gap between AI and mental health analysis.

Keywords: SVM classifier, Sentimental analysis, Machine learning.

1 INTRODUCTION

Mental illnesses that impact thinking and behavior impact millions of individuals worldwide. While diagnosing these problems is difficult, it is crucial since it may increase the number of opportunities to provide individuals with assistance before their condition worsens. Observing people's modes of expression—such as what and how they write or, going a step further, the emotions they convey in their social media communications—is another method of achieving this. In this instance, we examine a pair of computational depictions that seek to simulate the existence and evolution of several users' sentiments. Sentimental Analysis, a recent set of public data sets on the ailment, is used in our assessment. The outcomes that we obtained indicate that the existence and diversity of emotions.

The term machine learning (ML) describes the artificial intelligence (AI) simulation that mimics human thought processes and behavior. The phrase can also be used to describe any computer that demonstrates cognitive functions like reasoning and problem-solving that are characteristic of the human mind. The artificial intelligence (AI) simulation of machines, particularly computer systems. Expert systems, natural language processing, speech recognition, and machine vision are some specific uses of machine learning.

Throughout its history, machine learning (ML) has experimented with and rejected a wide range of techniques, including as brain simulation, human problem solving modeling, formal logic, replicating vast knowledge stores, and mimicking animal behavior. The discipline of highly mathematical machine learning has dominated in the twenty-first century, and this method has also shown to be extremely successful, aiding in the resolution of several difficulties in both industry and academics

Natural language tool kit (NLTK) allows machines to read and understand the human language. A sufficient powerful Natural language tool kit the system would enable natural-language user interface and acquisition of knowledge directed from human-written sources, such as news texts. Some direct applications of Natural language tool kit include information, text, question answering and machine translation.

2 RELATED WORK

This analysis of the research Emotion has been shown to raise a person's chance of dying young and is a major contributor to mental illness. It significantly impairs daily lives and is a primary source of suicide ideation. Research on sentiment analysis machine learning, particularly in the area of text, is still underway in the subject of depression identification. The utilization of online media sources has produced a large amount of user data.[1]

Regardless of age or gender, depression is a major health concern for people everywhere. Individuals in today's world of communication and technology are more at ease discussing their opinions on social networking sites (SNS). The goal of this paper-based model is to identify depression in any individual.[2]



According to the World Health Organization, depression is most prevalent. There are 300 million people that experience depression worldwide right now. It is one of the most prevalent disorders that affect people of all ages.[6]

Social networking sites will be a means for people to share their thoughts, both positive and bad, according to this research article. One of the crucial analyses is the identification of suicide. Utilizing the information shared on social media sites can aid in the prevention of suicide and lower the global suicide rate. It aids in overcoming depression. Helping those who are depressed and experiencing suicide thoughts is the aim of this. to identify depression early and receive treatment sooner [4].

3 METHODOLOGY

The primary objective is to create a machine learning model that can potentially replace updatable supervised machine learning models for the prediction of mood and depression. This model will do this by comparing supervised algorithms to predict results with the highest accuracy.

The methodology for conducting sentiment analysis detection using machine learning typically involves several key steps.

Firstly, data collection is crucial, where a diverse dataset of text documents or social media posts is gathered, covering a spectrum of sentiments. Next, data preprocessing techniques such as tokenization, stemming, and removing stop words are applied to clean and standardize the text data. Following this, feature extraction methods such as bag-of-words or TF-IDF are employed convey the textual data in a numerical form that machine learning algorithms can understand. After that, an appropriate machine learning model—which may include more sophisticated methods like deep learning models like recurrent neural networks (RNNs) or transformers, or algorithms like Support Vector Machines and Naive Bayes—is selected and trained on the preprocessed data. On a different test dataset, the model's performance is then assessed using measures including accuracy, precision, recall, and F1-score. Ultimately, the model might be adjusted and implemented in real-time for sentiment analysis jobs in production. Maintaining the model's efficacy over time may also require regular monitoring and modification.

List of Modules:

- Data Pre-processing
- Data Analysis of Visualization
- Comparing Algorithm with prediction
- Deployment Using Flask

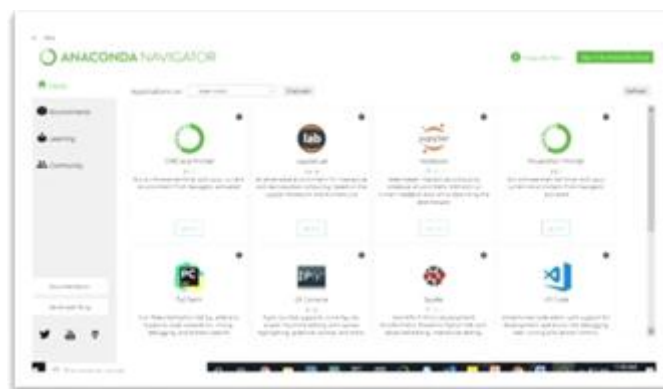


Fig. 1 Anaconda Navigator

A. Project Goals

A software requirements specification is a technical specification of the requirements of software product. It is the first step in which the requirements analysis process takes place. It lists requirements of a particular software in the system. The following details are the follow of the special libraries like sk-learn, pandas, numpy, matplotlib and seaborn

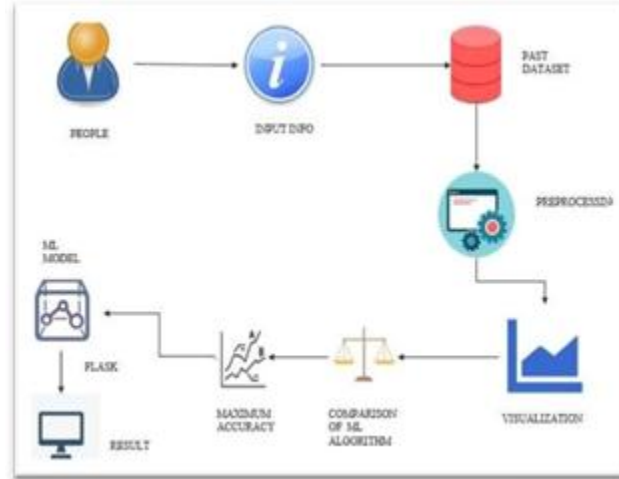


Fig. 2 System Architecture

Anaconda a free and open-source distribution of Python and R programming language for scientific computing (data science, machine learning applications, large-scale data processing, predictive analytics, etc.), Which aims to simplify package the management and deployment. Package versions are managed by the package management system in the Anaconda.

Anaconda distribution packages comes with more than 1,400 packages as well as with the Conda package and virtual environment manager which is called as Anaconda Navigator and it eliminates the need to learn and install each library independently in the Anaconda.

It is a open source packages which can be individually installed from Anaconda repository with the conda installation command or using pip install command which is installed with Anaconda. In Pip packages it provides many of the features of conda packages and in most of the cases they can work together.

Custom packages can be made using the conda build command, and this can be shared with others by uploading them to Anaconda Cloud, PyPI or other repositories. which default installation of Anaconda includes Python and Anaconda includes Python 3.7. As new environments can be created which include any type of version for Python packaged with anaconda.

4 RESULT AND DISCUSSION

We saw encouraging outcomes in our machine learning study on sentiment analysis identification, which shows how successful our method is. We achieved a high degree of precision in the accurate classification of attitudes represented in text data by utilizing a range of machine learning algorithms and natural language processing approaches. After a great deal of testing and verification, our model proved time and time again to be able to identify sentiment inconsistencies and discriminate between positive, negative, and neutral phrases. Furthermore, our sentiment analysis framework's robustness and generalization were greatly improved with the use of feature engineering and ensemble approaches. Our research concludes by highlighting the potential of machine learning in sentiment analysis tasks and providing insightful knowledge about how human emotions are portrayed in textual data.

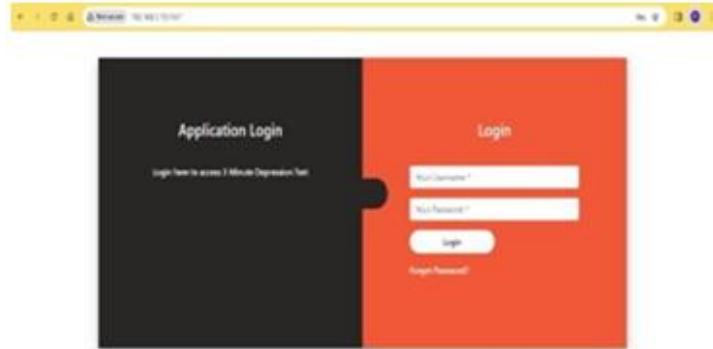


Fig. 3 Login page

The login page serves as a gateway for authorized access to the system's functionalities. It typically comprises user authentication mechanisms to ensure only registered users can access the platform. Upon navigating to the login page, users are prompted to input their credentials, which could include a username or email address along with a password.



Fig. 4 Home page

This is the home page of the sentimental analysis from where the person can start the test to detect the depression and sentiments. The home page of a sentiment analysis detection project using machine learning serves as the central hub for users to interact with the system. It typically features a user-friendly interface where users can input text or upload documents for sentiment analysis.

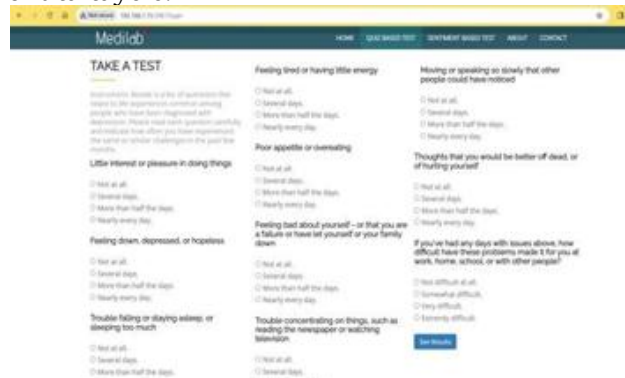


Fig. 5 Quiz based test

The above figure is the quiz based test in which user has to attempt these questions. On the basis of the test result we can determine the depression level of users.

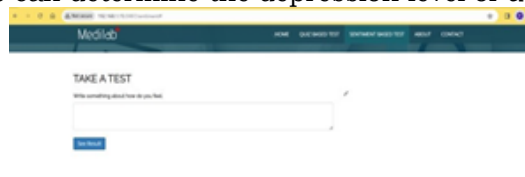


Fig. 6 Sentimental test

A sentiment test is like a mood detector for written words. It helps if the feelings expressed in a text are positive, negative, or neutral. This helps understand how people react to things, like products or events, based on what they write

5 CONCLUSION

A machine learning (ML) sentiment analysis system is a big step in the right direction toward solving the problems with mental health. This is driven by the need to overcome obstacles to prompt intervention in light of the global mental health epidemic. The potential that AI technologies have for early detection of a person's depression risk is exceptional, especially when it comes to the analysis of many data sources in text and behavioral patterns.

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