Problem Statement

Research Paper Summary

Depression Clustering and Analysis

Computer Science and Engineering
Shiv Nadar University Chennai

Depression Clustering and Analysis

Idea behind the topic

For young adults, college life has been the beginning of knowing the open world. Students want their experiences to be life-changing. These experiences that teens wish to have differ drastically, some spend their college life partying with friends, while others become more cautious about their careers and study hard. But this is also the phase where obstacles like melancholy and anxiety could arise . In today's world, depression is the first leading cause of adolescent suicides. The prevalence of anxiety and depression among college students has significantly increased since the Covid-19 pandemic began. According to a recent survey, serious depression and anxiety affect one out of every four teenagers .

From the observation made and being in the very scenarios, many middle and high school students have schedules rivalling top corporate executives, with an average day beginning at 6 a.m. and ending past 10 p.m , demanding schedule leaves many sleep-deprived with little time to develop basic independent living skills. This culture of hyperachievement and the joy of easy perfection are becoming more and more difficult for young adults to navigate.

Every year, thousands of people succeed in taking their lives and even more have attempted suicide at some point in their lives. Although we have reached the stage that hearing about suicide is now common, it should be viewed as trivial and petty. So, we intend to build a model and eventually a working web application which would group people according to their depression or mental states. After clustering people our main objective is to offer them solutions through an automated chatbot or any other guidance required in any perspective.

Software requirements / Various sub components

The project which is still in its developing stage will require several software platforms to achieve its success.

1. **PEBL** The primary software around which the project revolves around is PEBL (The Psychology Experiment Building Language). PEBL offers a simple programming language tailor-made for creating and conducting many standard experiments. It is Free software, licensed under the GPL, with both the compiled executables and source code available without charge.
2. **GOOGLE FORMS** Initial collection of data using the battery features that we created using PEBL will be collected using Google forms or excel sheets to use for clustering and ML modelling. It is planned to collect psychometric data from all the students of our university and from the surroundings.
3. **PYTHON LIBRARIES AND MODULES** After collection of data, the next major step of our project is to pre process the data, cleaning it, removing the outliers. Then we need to apply preferrable Machine Learning clustering or grouping algorithms like random forests to group the responses of the data we have. This grouping is mainly done to grade each cluster according to the recommended scales of depression prescribed by NIMHS. All these data manipulation would be basically done using python modules like NumPy, pandas, matplotlib, scikit, pyplot, seaborn.
4. **NLP**For the testing part of our model, we have planned to do web scrapping from open websites and social media handles like Twitter. With the scrapped data, again we would tune our model. So, for the model to understand text and image data, it is a necessary requirement to use Natural language processing and Image processing.
5. **FRONT-END**After the performance of the model is optimum and fine-tuned, the next major task is to develop and interactive website to put this idea to use. For the development of website, we would work on HTML, CSS, JAVASCRIPT, MONGODB.

Extension of this project

(Ideas we would implement, if time permits and if we could extend the project for the subsequent semester.)

- **MOBILE APPLICATION DEVELOPMENT** : Plans of building a mobile application is in contemplation. If we develop it, it would mostly be done using Flutter, a common mobile application development tool for both android and iOS.
- **INTERACTIVE CHATBOT** : The primary idea behind this chatbot is, after clustering people, if the user selects on this option, according to the scale of the depression that has been tagged to the user, the chatbot would automatically adjust to its intensity and serve as a company, catering to the needs of the user. One of the key catchpoints here, is to make the chatbot emote according to the user, as this project mainly focusses on emotions.

Stakeholders

Anyone who is part of, affected by, or recipient of the project

1. **Team members**
2. **Consultants**
3. **Common public(age range:18-45)**

Conclusion

Some people with depression may try to hide the signs from others, and others might not even realize that they have depression. Although well-known symptoms such as sadness or hopelessness can be easy to recognize, there are also other hidden signs of depression. So as of a general mental health analysis we would take a responsibility in getting the unaware informed of the seriousness of the situation(by the range scale) ,its consequences and the follow-ups for the betterment.

Team Members

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