Stress Analysis and Effective Solutions

International Institute of Information Technology, Pune

Mr. Keshav Tambre
dept.Information technology
International Institute of information technology
Pune, India
keshavt@isquareit.edu.in

Bhargavi D Dhade
dept.Information technology
International Institute of information technology
Pune, India
bhargavidhade121119@gmail.com

Raj D Garud
dept.Information technology
International Institute of information technology
Pune, India
rajdgarud@gmail.com

Mayuri Gajare
dept.Information technology
International Institute of information technology
Pune, India
magajare@gmail.com

Namrata Londhe
dept.Information technology
International Institute of information technology
Pune, India
namratalondhe1999@gmail.com

Abstract—**The most outcoming texture of any living being on this planet is his behavior, acknowledgment towards his work and surroundings. The factor affecting this texture is an expression or any deep stress of any kind. Being in this competitive generation of the world has made it quite difficult for all the ages to have a free mind, which is without any worries. The mental stress of every human makes them compensate for the most productive years of their life. To overcome all this, we have proposed a system that will try to connect and understand all that the suffering one can express. It's observed that mostly the emotionally suffering one needs is someone who can understand all that he/she has to say. And provided with an artificial character we give a virtual friend to the user. Thus, providing an active way to make the suffering one feel they have a companion who understands them in a virtual way. All of this is made with the help of an Interactive character. And the character not only interacts or makes the human feel heard but also provides entertaining solutions to their mental situations. This will help the victim overcome the fear of unwanted negative thoughts, resulting in a very free, positive, and productive mind.**

Keywords—*NLP, CNN, TD, IDF, SVM, sentiment analysis*

I. INTRODUCTION

In regular life no one really takes care of their stress and briefly ignores it. Many of them look over it but deep down in our brain all that stress is piled up and is ready to burst at any point of time. And if ever anyone is aware of their situation and seeks for the help from any professionals, they are labeled as mad people. Basically, in India only the mad seek mental care. Stress is a quite common factor these days, Stress results in various misfunctioning in the mood of the human. Stress when not managed for a long time can be converted into a deadly mental disorder. i.e., depression.

Thus, comes our system to help all needy to maintain their daily stress without going to anyone personally. The application does it all for the user, analysis of the stress and providing the interactive solutions. Mental health here is the major factor that is been taken care of in the system. Everyone feels sad, angry, alone, disgusted etc. at some or the other time of the day. Any individual facing an acute emotional issue in their personal life can directly use this application and get some mind refreshing solutions. All the user must do is open the application and in a very interactive and casual way the character conducts a conversation. These conversations can be about anything that the user wants. It can be personal, daily events update, casual event sharing diving into memories. The conversation is collected, and all the conversation is then passed to NLP where each word is analysed to the depth of it. The NLP is provided with all the sentiment dataset which is crosschecked with the conversation held and a result is produced which sums up all that is been put out by the user. It is basically in a percentage format, then the result is later used to give appropriate solution according to the feeling user is going through. This result is stored and is later used for further references about the improvement in the user's emotion handling.

II. LITERATURE SURVEY

A. Psychology

Lazarus, R. S., Deese, J., & Osler, S. F. The authors mention qualitative observations and stress performances, the interaction of emotions and motivation somehow related to stress and task components. It also speaks about verbal and perceptual-motor performances.[1]

Baillie, V., Norbeck, J. S., & Barnes, L. E. observed 87 of the family caregivers for effects of psychological well-being and social support, when the characteristics of the caregiver have included the effect of stress was found false or not

valid. It was later concluded that the caregivers who handled the elderly with a mental disorder or did extra time and did not have enough of the social life were at the greatest risk of getting depressed.[2]

Sadeh, A., Keinan, G., & Daon, first, held a quasi-experimental study to observe the coping relation between stress and sleep. 36 students were monitored on actigraphy and proper logs were maintained for the low and high-stress periods. The results suggested that the coping score was predictive to the students who had less sleep. Coping style is a key factor in sleep and stress relation.[3]

B. Text based emotion Recognition

The studies on text-based emotion recognition are mainly divided into three categories: keyword-based, learning-based, and hybrid recommendation approaches. Recent research focuses on the learning-based methods. Among the methods, the convolutional neural

network (CNN) for sentence classification has a great performance. This study is used for extracting sentence information. As we mentioned, it is hard to recognize the emotion of each utterance in dialogue since it is needed to consider the contextual information. The contextual LSTM architecture is proposed to measure the inter dependencies and relations of utterances in dialogue to solve this problem. In this paper, we will conduct experiments on the CNN model and the contextual LSTM architectures baselines.[4]

C. Statical Method

Manos Papagelis studied many statistics-based methods and among them selected Pearson's correlation method to find users with similar interest. Matrix was used to store information related to items and users as well as groups of items. Comparison was made among user based; item based, implicit rating and explicit rating. Here the data set used was a movie recommendation system, named MRS. Sakchai Tangwannawit. [5]

Used SVM technique. vocational 304 students of the academic year 2012 at Singburi Vocational College were providing data. Rough sets can be used to extract the

for prediction of personality traits. Rough Set is a recent statistical method that has been used in various fields such as medical, geological, and other fields for intelligent decision making. Author performed experiments with rough sets to predict personality traits Rough Set is a recent statistical method that has been used in various fields such as medical, geological, and other fields for intelligent decision making. Author performed experiments with rough sets to predict personality traits. [6]

III. RELATED WORK

Various applications are in the market that help reduce mental pressure. These applications are only the solution givers, their basic layout is a way to soothe oneself. Some applications help in mediation with calm music playing in the background. There are also applications that just have conversations with the user.

IV. OVERVIEW OF PROPOSED SYSTEM

A. Problem Statement

Stress is riding over everyday rituals and consuming the most productive time in human life. When not dealt with this in the early phase can transform into something life threatening for themselves. All the available resources are not efficient and friendly.

B. Existing system

Whenever one feels stressed or troubled by the current routine in life, they go out travelling, dining, site seeing. This is for regular and normal forms of stress. Which can not necessarily be satisfied with everyday routine. Thus, resulting in piling up of stress and unwanted emotions.

Most stressed o to seek medical help, but are labeled as mentally ill and declared as mad in society, which in a certain way brings shame to the personal.

C. Solutions

As mentioned, previously we have a user side and a character (System) side. The user is requested to fill all the personal details like email-id, age, work profession, gender, and such. What this does is it sets some constraints while doing further analysis. Later, moving forward we introduce our animated character, this character is going to be everywhere here on. This is the virtual character that the user has in terms of the friend. This character interacts with the user, in the form of conversation and tries to know all the details about the user. These conversations are very casual like we talk with any of our other friends. While conversing we talk in detail about everything happening in our life regularly.

Every conversation that takes place is passed to a NLP program. NLP helps in the fragmented division of every sentence. This is attended with a sentiment analysis algorithm using NLP. This NLP algorithm provides an exact emotion analysis of the user's conversation with the character. And the end result will decide what sort of solution to be provided. When the user converses they speak on an emotional level but while they are mentally stressed, they also lack to maintain their physical health. So, a basic physical health chart and to do's are given to the user. to maintain their proper physical health too.

solutions provided are mind freeing games, calm background music, Yoga exercises, and many others likely.

D. Algorithm in use

As mentioned previously the input passed to the algorithm is conversations of users. The input of provided should be in vector format hence transformation is required which is obtained doing as following: -

- Getting out all the punctuations and numbers if present.
- Conversion of all the words into lowercase.
- Removing stop words like (This, That, is, an).
- Tokenizing the text.
- Using the bag-of-words representation to convert the sentences into vectors.

1. STOP WORDS: Common words which are less interesting for the task at hand. These usually include articles such as 'a' and 'the', pronouns like 'i' and 'they', and prepositions like 'to' and 'from.

2. CORPUS: simply a collection of text that matters. 'Not great' is different from 'great'.

3. BOW (Bag of words): Vector representation of text

4. TD/IFD: Relative important words. context of multiple reviews.

We begin with **TD** this is normalized frequency:

(Word count in doc) / (Total word in doc)

The **IDF** is a weighting of the uniqueness of the word found in all of the documents. Here is the complete formula of TD/IDF:

td_idf(t,d) = wc(t,d)/wc(d)/dc(t)/dc()

where:

wc(t,d) = occurrences of term t in doc d

wc(d) = of words in doc d

dc(t) = of docs that has at least 1 occurrence of term t

dc () = of docs in collection.

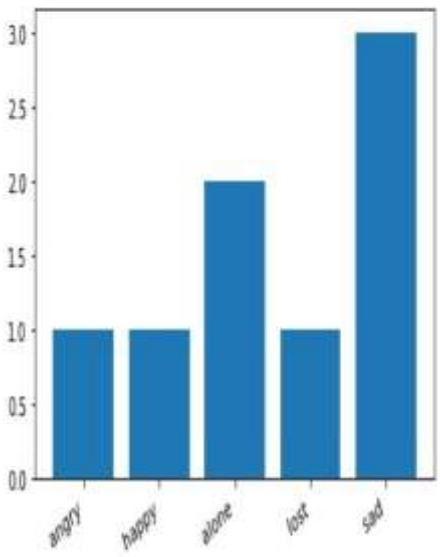
TEXTBLOB

1. TextBlob: Linguistic researchers have marked the sentiment of words based on their domain expertise. Sentiment of words can vary based on where they exist in a sentence. The TextBlob module permits us to take advantage of these labels. TextBlob searches all the words and phrases that it can assign polarity and subjectivity to, and average all of them together

2. Sentiment Labels: Each word during a corpus is labeled in terms of polarity and subjectivity (there are more labels also, but we're getting to ignore them for now). A corpus sentiment is the average of these.

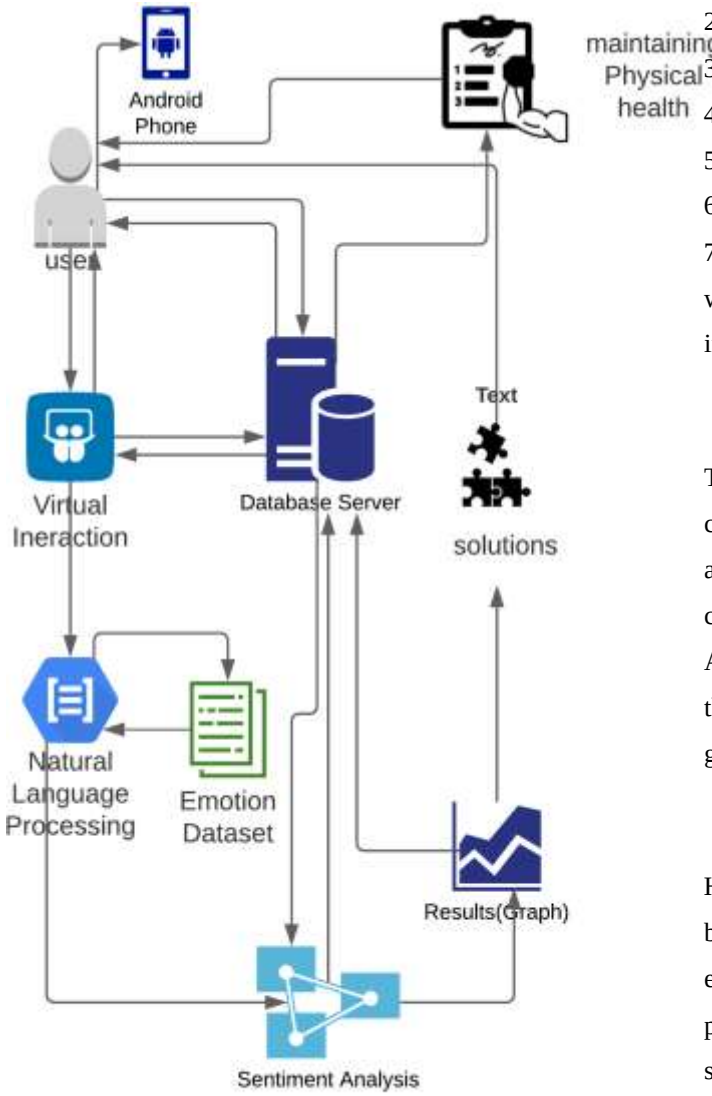
- Polarity: How positive or negative a word is. -1 is very negative. +1 is very positive.
- Subjectivity: How subjective, or opinionated a word is. 0 is fact. +1 is very much an opinion

```
[' angry', ' happy', ' alone', ' lost', ' sad', ' sad', ' alone', ' sad']
Counter({' sad': 3, ' alone': 2, ' angry': 1, ' happy': 1, ' lost': 1})
```




```
Negative Sentiment : 68.4%
Positive Sentiment : 16.9%
Neutal Sentiment  : 14.9%
Emoton expressed most :  sad
Final result :
Negative Sentiment : 68.4%
```

V. ARCHITECTURE OF THE SYSTEM



The user requires to have hold of an android or IOS mobile to have access to the application. The user then signs up to the application where all the required information is taken from the user. After a successful signup the user is directed and meets with the virtual 3d character. Here the conversations take place in the user and our character.

All this conversation is then passed to the (NLP) sentiment analysis algorithm and the dataset of emotion is used to check the sentiments shown by the user. The algorithm passes the proper reading of the positive and negative sentiments expressed and the graphical representation is also shown. Hence taking to the solutions which gives users all the help to free their mind from whatever is bothering them. An additional system on physical health maintenance is also introduced.

VI. ADVANTAGES

1. Stress free time.
2. One can be more productive in their life.
3. Their mental state is lightened.
4. The solutions give some refreshment to the users.
5. Having a virtual friend to talk to.
6. Health of the user is also monitored.
7. Traditional approach of searching healing assignments will be eliminated as all the help required will be provided in the application itself.

VII. FUTURE SCOPE OF THIS PROJECT

The scope of this project is limitless. Where we use 3-d characters to interact, we can also use new technologies like augmented Reality, or virtual reality. All the environments can be set according to the user's wants.

A traditional approach of psychologists can be brought in the application where they can help themselves when in greater need.

VIII. CONCLUSION

Hence as mentioned above we propose that the project will be a quick fix for the stress or any other negative bubbling emotion. Users get a virtual friend to talk to and share all the problems faced by individuals. Proper analysis of the user's sentiment is done. Effective solutions are provided.

ACKNOWLEDGMENT

Here we express our sincere thanks to our project guide Mr. Keshav Tambre and HOD Prof. Sarang Saoji for their constant support and for providing a platform. We are also thankful to all other researchers for their publications.

REFERENCES

[1] Lazarus, R. S., Deese, J., & Osler, S. F. (1952) "The effect on psychological stress on perforance".

[2] Baillie, V., Norbeck, J. S., & Barnes, L. E. (1988) "Stress social support and psychological distress of family caregivers of the elderly".

[3] Sadeh, A., Keinan, G., & Daon, K. (2004). "Effect of stress on sleep: The moderating role on coping style".

[4] S. Ghosh, O. Vinyals, B. Strope, S. Roy, T. Dean, and L. Heck, "Contextual lstm (clstm) models for large scale nlp tasks," arXiv preprint arXiv:1602.06291, 2016.

[5] Sakchai Tangwannawit and Montean Rattanasiriwongwut, "Comparing the Strengths and Difficulties Questionnaire (SDQ) and Behavior Consideration Assessment Using SVM Techniques", DOI: 10.7763/IPEDR. 2014. V70. 16.

[6] Umang Gupta, Niladri Chatterjee, "Personality Traits Identification using Rough sets based Machine Learning", IEEE 2013 International Symposium on Computational and Business Intelligence..

[7] M. Young, The Technical Writer's Handbook. Mill Valley, CA: University Science, 1989.

[8] https://towardsdatascience.com/nlp-sentiment-analysis-for-beginners-e7897f976897

[9] https://www.healthline.com/health/depression

[10] https://sites.google.com/site/theresistancetochange/home/psychological-barriers

[11] "Treating stimuli as a random factor in social psychology: A new and comprehensive solution to a pervasive but largely ignored problem"Judd, C. M., Westfall, J., & Kenny, D. A. (2012). Treating stimuli as a random factor in social psychology: A new and comprehensive solution to a pervasive but largely ignored problem. Journal of Personality and Social Psychology, 103(1), 54–69.

[12] "Testing and cognitive psychology." Sternberg, R. J. (1981). Testing and cognitive psychology. American Psychologist, 36(10), 1181–1189.