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Depression Detection and Reduction Approaches A Survey

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ABSTRACT: Depression doesn't mean only tension and stress, there are many factors need to be consider to detect exact depression and its intensity. The aim of this paper is to explore human depression reasons and thorough literature and current state of art systems which identifies depression. There are many current state of are systems which can identify the depression and reduce it also. But considering the human beings suffered from this depression in amount and systems to work upon it is having a gap. This paper is exploring such research and their comparisons. This paper explores the Machine Learning (ML) approaches to detection and reduce the human depression along with this, their data-sets and training methodology and ML algorithms also.

KEYWORDS: Machine Learning, ML Algorithm, Dataset, Training Methodology

I. INTRODUCTION

currently, people face depression, this is often the common thing after this COVID 19 outbreak, there are many symptoms of depressions like Feelings of helplessness and hopelessness, Loss of interest in daily activities, Appetite or weight changes. Significant weight loss or weight gain—a change of quite 5% of weight during a month. There are portals where human will interact to those depressed people but its success rate is just too low. the aim of this project is to research the thorough literature review of such research areas. There are portals available to scale back Depression of depressed person. There are drawbacks persists for such portals as either the portals are down of success rate is a smaller amount or some times human intervention is required. All such pros and cons are well analyzed and defined during this paper.

II. LITERATURE REVIEW

Data mining techniques [1] are applied to a broad spectrum of solutions to unravel problems through analysis, data acquisition, and prediction. Decision trees are most ordinarily used for classification and prediction. With the appliance of fuzzy clustering it's possible to construct a fuzzy decision tree that is more suitable for a prediction on selected data. In this article, we specialise in analyzing metabolic data. This data allows us to detect Depression that features a significant influence on human reliability. The analysis of those metabolic shows that it's possible to predict the occurrence of depression. These results may improve the treatment and prevention of depression. Further detection of depression in critical domains can increase the precision of Human Reliability Analysis. Early detection of depression are often applied in critical domains like police officers, firearm licenses, management positions, university students, but also in space ships of human crews. ***** data processing techniques were applied to metabolite analysis in this paper. We focused on the fuzzy decision tree (FDT) and how its effects prediction of depression. it's possible to use FDT for analyzing metabolites from depressed and control group. The main advantage of using FDT is readability and a better understanding of results. Interpretation of those results is considerably better. data processing helps analyze data, and results of FDT are validated against measured data. The main problem is acquiring real data that defines whether it is depressive group or not. Another problem is in obtaining the concentration of individual metabolites. the matter is also during a small number of samples. Measuring and retrieving these data is extremely costly and timely. Some data-mining techniques are unsuitable, like SVM, neural networks for a small amount of knowledge . Specifically, the utilization of fuzzy techniques and how fuzzy decision trees, fuzzy random forest, fuzzy clustering could also be a forward option for the longer term .

[2]   manic depression is characterized by recurrent episodes of mania and depression and affects about 1% of the adult population. The condition can have a serious impact on an individual's ability to function and is related to a long-term risk of suicide. during this paper, we report on the utilization of self-rated mood data to forecast subsequent week's depression ratings. the info utilized in the study are collected using SMS text messaging and comprises one time

series of roughly weekly mood ratings for every patient. we discover a good variation between series: some exhibit an outsized change in mean over the monitored period and there's a variation in correlation structure. Almost half the statistic are forecast better by unconditional mean than by persistence. Two methods are employed for forecasting: exponential smoothing and Gaussian process regression. Neither approach gives an improvement over a persistence baseline. We conclude that Depression statistic from patients with manic depression are very heterogeneous and that this constrains the accuracy of automated mood forecasting across the set of patients. However, the dataset may be a valuable resource and work remains to be done which may end in clinically useful information and tools. *****We conclude that for a few patients, effective depression forecasts can't be remodeled the amount of every week because their time series exhibit little serial correlation. Other patients can be forecast to a degree of accuracy, but the clinical benefit is not clear because they form a minority of the entire set. An increase in accuracy could be gained by partitioning the dataset and forecasting different groups separately but it seems unlikely that the development would be quite marginal when averaged over the entire set. However, the mania statistic remain unexplored, and although these seem less amenable than Depression series, it might be worth summarizing their qualities. There is also the potential to use unsupervised methods such as clustering to spot groups of patients within the set and compare these with more detailed demographic and diagnostic information. Finally, some use could be made from the time taken for the patients to reply to prompt messages and therefore the statistics of missing data, if allowance are often made for the SMS latency. The dataset may be a valuable resource and more work remains to be done which may end in clinically useful information and tools

[3]   mental disease features a deep impact on individuals, families, and by extension, society as an entire . Social networks allow individuals with mental disorders to speak with others sufferers via online communities, providing a useful resource for studies on textual signs of psychological health problems. Mental disorders often occur in combinations, e.g., a patient with an mental disorder can also develop depression. This co-occurring psychological state condition provides the main target for our work on classifying online communities with an interest in depression. For this, we've crawled an outsized body of 620,000 posts made by 80,000 users in 247 online communities.We have extracted the topics and psycholinguistic features expressed in the posts, using these as inputs to our model. Following a machine learning technique, we've formulated a joint modelling framework so as to classify mental health-related co-occurring online communities from these features. Finally, we performed empirical validation of the model on the crawled dataset where our model outperforms recent state-of-the-art baselines. *****This study demonstrates that the linguistic features and topics discussed amongst the web communities have the potential to capture the mental status and presence of mental health related communities. variety of serious examples were found where these features have strong indicative powers in the prediction of co-occurring communities curious about depression. This result shows the potential of social media and online communities within the early screening and monitoring of mental health-related communities with an interest in depression.

[4]   paper discusses the semantic network approach to identify affects in tongue input and focusses on representing patio-temporal affect information. it's been observed that this approach performs better in analysis of affect information which will be effectively utilized for the prognosis of human cognitive behavior. The research add this paper describes a replacement approach towards simple representation of multidimensional affect data that facilitates the supply of emotions or affects with varying granularity. The analysis algorithm thus executed on the semantic representation generates temporally significant behavior patterns. The analysis of the semantic network generates temporally significant behavior patterns. The framework has been designed to be extensible over a wide sort of applications in cognitive computing. *****The SN approach performs both spatial and temporal analysis on the extracted text affect features. during this approach, no random seed weights are applied to the nodes. Hence clustering algorithm works consistently for an equivalent sort of data. Since the causality level and symptom buckets are clearly identified within the SCM module, the convergence on the clusters is deterministic. Since the ARM module maintains the behavior pattern during a time-based manner, the semantic network analysis can predict the prognosis of the present condition. In the current work, the linguistic i.e. text feature extraction classifies high level features like vocabulary, accents, repetitive contents or patterns; symptoms like anxiety, fidgetiness and irritability weren't successfully extracted from text inputs though. The SN model is meant such the grammatical structure for text data needn't be strictly 265followed. The SN analysis model thus implemented has been successful in giving accuracy of quite 85algorithm stresses on attaching patio-temporal semantics to simple nodes, the framework construction are often easily extended to figure on different psychological ailments in addition to depression.

[5]   Building on previous researches, this study empirically tested the connection between undergraduates' academic stress and their perceived psychological distress, and therefore the moderating effects of psychological capital. employing a sample of 118 undergraduates from a university located in Northern China. The hierarchical multivariate analysis with SPSS 16.0 was employed to check the hypotheses. The results indicated that undergraduates' academic stress was positively associated with their perceived psychological distress, like depression; undergraduates'

psychological capital was negatively related to their perceived psychological distress, like anxiety, and undergraduates' psychological capital moderated the relationship between their academic stress and depression. within the end, limitations and practical applications were offered. ***** Extending prior research, this study empirically tested the moderating effects of psychological capital on the relationships between undergraduates' academic stress and their psychological distress (depression). The results displayed that the impacts of undergraduates' academic on their psychological distress (depression) may be attenuated by their positive psychological states, that is, for the undergraduate who perceives higher level of psychological capital, the consequences of educational stress on their psychological distress (depression) could also be weakened, or maybe alter the connection pattern even as the current study results indicated. This result suggests that we should always concentrate to the undergraduate's positive psychological states like psychological capital in helping the undergraduate affect or overcome the negative effects of his/her perceived academic stress within the future. Several limitations of this study should be noted. First, this study focused solely on the undergraduates from one university in Northern China, care must be taken when generalizing the findings to other undergraduate populations. there's a requirement for replication on a more heterogeneous population and larger university setting so on increase generalizations. Second, we asked the undergraduates to estimate their academic stress, psychological distress, and psychological capital at an equivalent time, using an equivalent questionnaire, these variables weren't measured independently, common method variation couldn't be avoided, and therefore the use of cross–sectional data implies that cause–effect relationships might not be inferred from the findings of this study. for instance , Misra McKean (2000) argued that anxiety, time management, and leisure satisfaction were all predictors of educational stress within the multivariate analysis [41]. Thus, using longitudinal designs will be needed to enhance the strength of the findings in further study. To summarize, this study empirically tested the relationship between academic stress and undergraduates' negative emotional outcomes and therefore the moderating effects of psychological capital. The research results indicated that academic stress had positive impacts on undergraduates' psychological distress, and the positive psychological states like psychological capital of them may influence the connection between academic stress and therefore the undergraduate's psychological distress. The research results suggested that so as to lessen the possible negative impacts of educational stress, one of the available and sustainable approaches could also be to invest, manage, and develop the undergraduates' positive psychological states like psychological capital.

This paper [6] builds up an attack signature age approach which will be utilized for signature-based Intrusion Detection System (IDS) which depends on GA to make new attack marks from an appointment of introductory attack signature. Attack signature generation comprises of varied advances beginning with proposed approach, Use of Genetic Algorithm, Chromosome representation, Fitness function crossover and mutation. For the experimentation they need made their own dataset. The approach presently addresses the creation of both straightforward and sophisticated sort of attacks including SQL injection, XPath injection, DoS and privilege escalation. A GA needs an appointment of population questions as input and produces another arrangement of population as output. The generated output population comprises of latest and different objects as compared with original population.

- [6] Depression a modern epidemic of recent era has always drawn the eye of researcher's to find evaluate the extent , causes prevention. According to psychiatrists it's not a psychological disorder but it creates the stimulation simulation of co-ordination failure. The worst case of the leading depression level may contemplates an individual to attempt suicide, loss of energy, insomnia etc. This epidemic causes severe personal and public health challenges. annually thousands of many people are affected by depression and a couple of receives adequate treatment. Keeping view at the trend of predicting, this paper has been proposed tried to find out the persons suffering from depression and their level of illness. The work is self motivated. Here the concept of apriority algorithm association rule mining is employed so as to extract the knowledge from an out-sized collection of database of concerned persons. ***** the general objective of the work is to predict more accurately the presence of depression and tried to maintain the socio-economical development up to some extent by eliminating this epidemic. This paper aimed its proper utilization at different levels and communities by predicting the expressional level. It will provide the graceful and reliable environment of labor place and successful professional life. The work are often extended in future for prediction at individual level and management with security, and providing prevention techniques. Other data processing techniques also can be used for prediction e.g. clustering, statistic , association rules etc. The text mining are often wont to mine and analyze huge amount of unstructured data available in healthcare industry database.

This paper [8] uses novel deep learning technique for intrusion detection, the authors have proposed two techniques called non-symmetric deep auto-encoder (NDAE) and novel deep learning model developed using stacked NDAEs. NDAE is an auto-encoder which is non-symmetrical multiple hidden layers. NDAE can be used as a hierarchical unsupervised feature extractor. The reason behind its use is that to reduce both computational and time overhead along with accuracy. The experiment has used graphics processing unit (GPU)enabled TensorFlow, KDD Cup 99 and NSL-KDD datasets. Stacking the NDAEs offers a layer-wise unsupervised representation learning algorithm. It also has

feature extraction capabilities, so it is able to refine the model by prioritizing the most descriptive features. They have combined the deep learning power of stacked NDAEs with a shallow learning classifier. In the experiments, the NSL-KDD dataset is used with the 10-fold cross-validation approach in Scikit Learn. The KDD Cup '99 Classification 5-classes dataset evaluation, the results show that proposed model gives an average accuracy of 97.85%.The proposed model has produced promising results with F-measure as 87.37%, recall is 85.42% and precision is 100.00%.The proposed model shows accuracy of 97.85%.

This paper [9] introduces a work which incorporates DM and IDS idea which is utilized for distinguishing related information with less running time. The proposed EDADT algorithm is produced for fathoming the undertaking of characterization of information which is Hybrid IDS. The EDADT carries on not quite the same as ordinary decision tree. To limit the workload of system administrator, SNORT is included with irregularity based methodologies. The proposed system naturally arranges the information relying upon rules inside it. The utilization of semi-regulated approach takes care of issues of directed and unsupervised techniques and semi-managed approach alludes to little measure of marked information and additionally gigantic unlabeled information can be named.

III. COMPARISON OF SYSTEMS

Depression is different from usual mood fluctuations and short-lived emotional responses to challenges in lifestyle . Especially when long-lasting and with moderate or severe intensity, depression may become a significant health condition. It can cause the affected person to suffer greatly and performance poorly at work, at college and within the family. The concept of decision trees is one of the most used formalism for decision making. Decision making processes can be characterized as a selection of good enough alternative to decision options from possible decision alternatives. problem can be enhanced by the use of fuzzy logic. The improvement emerges from the elasticity of fuzzy sets. A semantic network approach to affect analysis of depression. According to the duration of stress, psychological stresses could also be divided into two classes: acute psychological stress chronic psychological stress.this can be reduce by sample and procedure method. this will make positive impact on Human resource development.

IV. PROPOSED ARCHITECTURE

The architecture mainly consists of seven different modules. The names of each module is self-explanatory. First submodule consists of literature review where we have studied current state of art papers and their depth to solve this problem.The second submodule consists of creating the datset for our model which will be used for both training and testing purpose, later on we will add real life examples as human being who is depressed to test this application. After creating the dataset for most of the machine learning algorithm we need the preprocessing of the dataset. This step is depend on how well and bad our daset is structure.The forth submodule consists of Selecting machine learning algorithm whichf is the heart of the project. For this step we need the help from training dataset. There also we can different approaches for training of our applition or ML algoriuthm.The result and performance module consists of checking and analysing the performance of our project which will be done by using different performance matrices such as accuracy and false positive rates etc. Last and most importance the developed application is integrated with UI. For backend we have decided to work on Python and UI will be designed in React JavaScript Library for better performance.

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V. CONCLUSION

Depression is a mental disorder that is pervasive in the world and affects us all. Unlike many large scale international problems, a solution for depression is at hand. Efficacious and cost-effective treatments are available to improve the health and the lives of the millions of people around the world suffering from depression. On an individual, community, and national level, it is time to educate ourselves about depression and support those who are suffering from this mental disorder through technology like ML an AL.

| No.	Paper Name	Publication Year	Methodology	
1	Human Reliability evolution Through analysis of depression prediction based on metabolic data, Probe, U2R, and R2L	2019	Fuzzification and Fuzzy decision Tree	
2	Forcasting Depression in Bipolar disorder	2012	Exponential smoothing and Gaussian process regression	
3	A Framework for Classifying online mental health	2016	Dataset and Feature Extraction	
4	A semantic network approach to affect analysis	2017	knowledge base and data set design	
5	The relationship between Academic Stress And Psychological Distress	2009	sample and procedure	
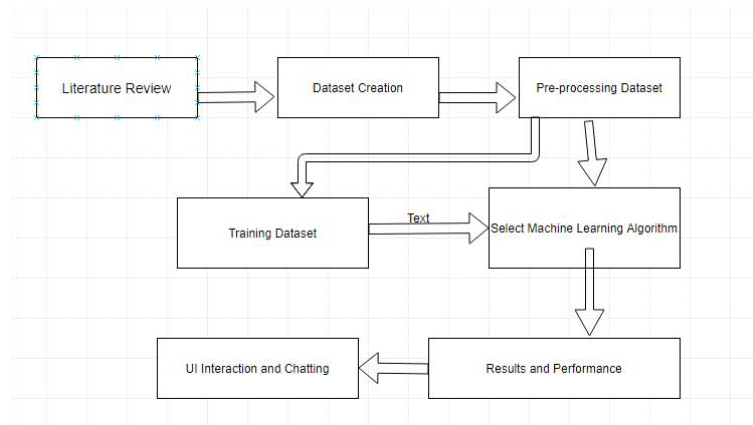
Fig. 1. Propose Architecture Diagram

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