An Efficient Identification of Mental Stress by Utilizing Social Network

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Abstract -The growth of social network leads to more advantages as well as problematic issues. Now days the symptoms and result of this metal stress was analyzed passively and delayed clinical intervention. To overcome this issue, an early stage of identifying online social behavior through analysis in efficient way is proposed. It is challenging to detect SNMSs because the mental status cannot be directly observed from online social activity logs. Through social networks n number of users is communicating in the form of text can't be analyzed manually to identify the stage of particular user. Manual way of analyzing user chat history will leads to privacy issues therefore this issue has been overcome through Machine Learning (ML). In ML, Natural language processing (NLP) is implemented that analysis the text commented and understand the meaning of the comment. By this analysis a system will identify whether the person is in normal, good or bad (depression) situation without affecting their privacy and confidentiality of data. Therefore, our system will read each word in a command and analysis its meaning and monitor particular person for a specific period and identify whether the person is in good or in depression situation. The person situation is not good then intimation will be send to respective person's relative mail hence this leads to saving a person life from unexpected event occurrence.

Keywords: Social Mental Stress, NLP, Machine Learning, Security and Sentiment Analysis.

I. INTRODUCTION

Text mining is a strategy to focus charming and significant guides to examine data from printed data sources. Content mining is a multi-disciplinary field subject to information recuperation, data mining, AI, bits of knowledge, and computational derivation. Content mining oversees basic language content which is taken care of in semi-sorted out and unstructured arrangement. Content mining techniques are reliably applied in industry, the insightful network, web applications, web and various fields. Application locales like web lists, customer relationship the official's system, station messages, thing proposition assessment, distortion disclosure, and online life examination utilize content burrowing for evaluation mining, feature extraction, idea, farsighted, and design examination.
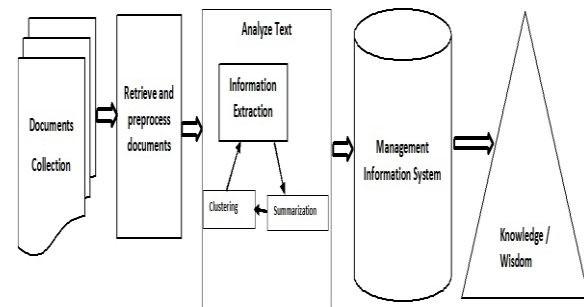

Fig 1: Text Mining Process

MACHINE LEARNING

Machine learning has become one of the main-stays of information technology. With the regularly expanding measure of information opening up there is valid justification to accept that savvy information investigation will turn out to be significantly increasingly unavoidable as a fundamental element for mechanical purposes. A great part of the study of AI is to take care of those issues and give great assurances to the arrangement. There is various ways a calculation can show an issue dependent on its cooperation's with the experience or condition or info information. For this entire right off the bat we need to embrace a learning style that a calculation can receive. There are just not many primary learning models that a calculation can have the method for arranging AI calculations is helpful on the grounds that it powers to consider the jobs of info information and the model of prep apportion process and choosing the one which is generally appropriate for issue for target results.

A. SUPERVISED LEARNING

At the point when an estimation gains from model data and related target responses that can involve numeric characteristics or string names, for instance, classes or names, in order to later anticipate the correct response when given new models goes under the grouping of Supervised learning. This procedure is in actuality like human learning under the supervision of an instructor. The educator gives certifiable advisers for the understudy to recall, and the understudy by then gets general benchmarks from these specific models.

B. UNSUPERVISED LEARNING

The calculation gains from plain models with no related response, leaving to the figuring to choose the data

structures alone. This kind of count will all in all reconstruct the data into something else, for instance, new incorporates that may address a class or another course of action of un-associated characteristics. They are useful in giving individuals bits of information into the noteworthiness of data and new significant commitments to oversaw AI figuring's. As a kind of learning, it takes after the techniques individuals use to comprehend that particular articles or events are from a comparative class, for instance, by watching the degree of similarity between things. Some proposition systems that you find on the web through publicizing automation rely upon this sort of learning.

C. SENTIMENT ANALYSIS

Sentiment analysis is a method which is used to remove the noteworthy information in the records. At the point when everything is stated, supposition mining endeavors to comprehend the inclination of a creator about some specific perspective and moreover the all things considered sensible furthest point of a document. The sentiment may be a judgment, disposition or appraisal of the creator. A middle issue rights now an assumption gathering, where a review is assigned a positive or negative appraisal of a mistreated thing (film, book, etc).

D. OBJECTIVE OF OUR WORK

- ❖ To analyze user chat comments systematically without creating privacy issues.
- ❖ To identify social network mental disorders of addictive users and analyzing their depressed state.
- ❖ Efficiently detect user situation and takes necessary steps according to it. It does not affect user privacy and confidentiality of their data. Protect user life by providing perfect time remedy.

II.LITERATURE SURVEY

Baek YM, Bae Y, Jang H (2012), With the advent of social network sites (SNSs), people can efficiently maintain preexisting social relationships and make online friendships without offline encounters. While such technological features of SNSs hold a variety of potential for individual and collective benefits, some scholars warn that use of SNSs might lead to socially negative consequences, such as social isolation, erosion of social cohesion, or SNS addiction. This study distinguishes types of SNS relationships, and investigates their relationships with social isolation, interpersonal trust, and SNS addiction. We classify SNS relationships into two types: (a) social relationships based on reciprocity between a user and his/her friends, and (b) parasocial relationships in which an ordinary user is aware of activities of a celebrity (e.g., famous actors, athletes, and others) but not vice versa.

Saha B et.al (2016), describes Mental illness has a deep impact on individuals, families, and by extension, society as a whole. Social networks allow individuals with mental disorders to communicate with others sufferers via online communities, providing an invaluable resource for studies on textual signs of psychological health problems.

Mental disorders often occur in combinations, e.g., a patient with an anxiety disorder may also develop depression. This co-occurring mental health condition provides the focus for our work on classifying online communities with an interest in depression. For this, we have crawled a large 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 have formulated a joint modeling framework in order to classify mental health-related co-occurring online communities from these features

Kun-Lin Liu (2012), discusses the goal of this task is to discover the attitude or opinion of the tweets, which is typically formulated as a machine learning based text classification problem. Some methods use manually labeled data to train fully supervised models, while others use some noisy labels, such as emoticons and hash tags, for model training. Hence, the best strategy is to utilize both manually labeled data and noisy labeled data for training. However, how to seamlessly integrate these two different kinds of data into the same learning framework is still a challenge. In this paper, we present a novel model, called emoticon smoothed language model (ESLAM), to handle this challenge. The basic idea is to train a language model based on the manually labeled data, and then use the noisy emoticon data for smoothing.

Chun-Hao Chang et.al (2016), discusses about effects of Mental disorders that are currently affecting millions of people from different cultures, age groups and geographic regions. The challenge of mental disorders is that they are difficult to detect on suffering patients, thus presenting an alarming number of undetected cases and misdiagnosis. In this paper, we aim at building predictive models that leverage language and behavioral patterns, used particularly in social media, to determine whether a user is suffering from two cases of mental disorder. These predictive models are made possible by employing a novel data collection process, coined as Subconscious Crowdsourcing, which helps to collect a faster and more reliable dataset of patients.

Munmun De Choudhury et.al (2013), presents Major depression constitutes a serious challenge in personal and public health. We first employ crowdsourcing to compile a set of Twitter users who report being diagnosed with clinical depression, based on a standard psychometric instrument. Through their social media postings over a year preceding the onset of depression, we measure behavioral attributes relating to social engagement, emotion, language and linguistic styles, ego network, and mentions of antidepressant medications. We leverage these behavioral cues, to build a statistical classifier that provides estimates of the risk of depression, before the reported onset. We find that social media contains useful signals for characterizing the onset of depression in individuals, as measured through decrease in social activity, raised negative affect, highly clustered ego networks, heightened relational and medicinal concerns, and greater expression of religious involvement.

Hong-Han Shuai et.al (2016), presents An increasing number of social network mental disorders (SNMDs), such

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as Cyber-Relationship Addiction, Information Overload, and Net Compulsion, have been recently noted. Symptoms of these mental disorders are usually observed passively today, resulting in delayed clinical intervention. In this paper, we argue that mining online social behavior provides an opportunity to actively identify SNMDs at an early stage. It is challenging to detect SNMDs because the mental factors considered in standard diagnostic criteria (questionnaire) cannot be observed from online social activity logs. Our approach, new and innovative to the practice of SNMD detection, does not rely on self-revealing of those mental factors via questionnaires. Instead, we propose a machine learning framework, namely, Social Network Mental Disorder Detection (SNMDD) that exploits features extracted from social network data to accurately identify potential cases of SNMDs.

III. METHODOLOGY

3.1 INTRODUCTION

In our proposed we first identify positive newsfeeds and then calculate the profile similarity and relation familiarity between friends. As another example, a para social relationship is an asymmetric interpersonal relationship, i.e., one party cares more about the other, but the other does not. This asymmetric relationship is related to loneliness, one of the primary mental factors pushing users with SNMDs to excessively access online social media. Therefore, we extract the ratio of the number of actions to and from friends of a user as a feature.

3.2 IMPLEMENTATION OF PROPOSED WORK

A machine learning framework, namely, Natural language processing (NLP) is proposed which examination the content remarked by every client and comprehends the importance of the remark. By this examination a framework will recognize whether the individual is in typical, fortunate or unfortunate (melancholy) circumstance without influencing their protection and privacy of information. Subsequently our framework will peruse each word in an order and examination its significance and screen specific individual for a particular period and distinguish whether the individual is inacceptable or in misery circumstance. The individual circumstance isn't acceptable then suggestion will be send to particular individual's relative mail consequently this prompts sparing an individual life from sudden occasion event.
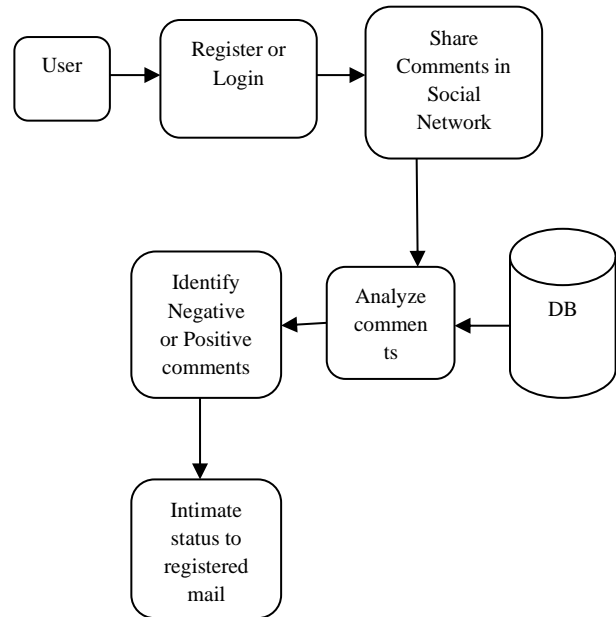

Fig 2: Proposed System Working Architecture

User comments shared between two users are extracted and analyzed for identifying the mental status of particular user. Here, shared remarks of clients will be taken as information and examination will be finished. The investigation has been prepared by looking at the outcome records got from database. For productive examination SVM classifier is utilized. Thusly contrasting shared remarks of client, mental status of client will be recognized.

3.2.1 NATURAL LANGUAGE PROCESSING WORKS

NLP involves applying calculations to recognize and extricate the regular language decides with the end goal that the unstructured language information is changed over into a structure that PCs can comprehend. At the point when the content has been given, the PC will use calculations to remove importance related with each sentence and gather the basic information from them.

3.2.2 THE TECHNIQUES USED IN NLP

i. SYNTAX

Syntax refers to the arrangement of words in a sentence such that they make grammatical sense. In NLP, syntactic examination is utilized to evaluate how the common language lines up with the linguistic guidelines. PC calculations are utilized to apply syntactic principles to a gathering of words and get importance from them.

Here are some syntax techniques that can be used

Lemmatization: It involves lessening the different curved types of a word into a solitary structure for simple investigation.

Morphological segmentation: It includes isolating words into singular units called morphemes.

Word segmentation: It includes isolating an enormous bit of persistent content into particular units.

Part-of-speech tagging: It includes distinguishing the grammatical feature for each word.

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Parsing: It includes undertaking linguistic investigation for the provided sentence.

Sentence breaking: It includes putting sentence limits on a huge bit of content.

Stemming: It includes slicing the curved words to their root structure.

ii. SEMANTICS

Semantics refers to the implying that is passed on by a book. Semantic examination is one of the troublesome parts of Natural Language Processing that has not been completely settled at this point. It includes applying PC calculations to comprehend the significance and understanding of words and how sentences are organized. Here are some techniques in semantic analysis:

Named entity recognition (NER): It includes deciding the pieces of a book that can be recognized and classified into preset gatherings. Instances of such gatherings incorporate names of individuals and names of spots.

Word sense disambiguation: It includes offering importance to a word dependent on the specific situation.

Natural language generation: It includes utilizing databases to determine semantic goals and convert them into human language.

iii. WORKING PROCESS

1-Preprocess Reviews: read reviews, use a morphology and part-of-speech tagging systems to:
   a. Find part-of-speech and root for each word in the text
   b. Identify adjectives in the text
   c. Check if neglected tool (word) is attached to the adjectives

2-Apply Rules: Extract attributes and associate them with their values (adjectives) that are labeled in step #1.

a. Tag up to two words headed by an adjective, stop when encountering a verb, particle or punctuation mark.

b. Use the following rules to form adjective phrases:

Adjective Phrase → <Attribute><Adjective>
| <Attribute><Neglect-Tool><Adjective>
Attribute → Simple Attribute | Compound Attribute

c. Check if <adjective> is already in adjectives table, find its classification, either positive or negative, otherwise classify it and update the adjectives table

d. Check if <attribute> either if it is a simple or compound is in attributes table, if not validate it and update attributes table

3-Update Graph: use the output from step #2 (attributes/values) to update graph by updating frequency of each node and each edge. Each node in the graph contains either an attribute or a value, attribute nodes connected to values nodes through edges.

iv. SVM CLASSIFIER

The Support Vector Machine (SVM) being proposed as a classifier to take care of the issues for perceiving design between two gatherings. Bolster Vector Machine (SVM) expects to recognize the best edge detachment of the hyperactive plane between two gatherings of information. It was initially expected for unraveling divisible cases, however can be reached out to explain the straightly non-distinct case by mapping the first information vector to spaces of higher measurements. So additionally SVM material to data centers with nonlinear decision surfaces by interfacing with a system perceived as the part method that designs the data to a higher dimensional segment space, where a direct disconnecting hyper plane can be dispatch. Consequently SVM is utilized to order precisely that specific remark is glad, dismal or unbiased remark. In light of prepared dataset new remark words were examined and for precise characterization SVM is utilized.

v. RESULT AND DISCUSSION

The accurate prediction of social mental disorders was done through NLP and efficient classification process (SVM). The secure and accurate prediction of user mental stage is shown below.
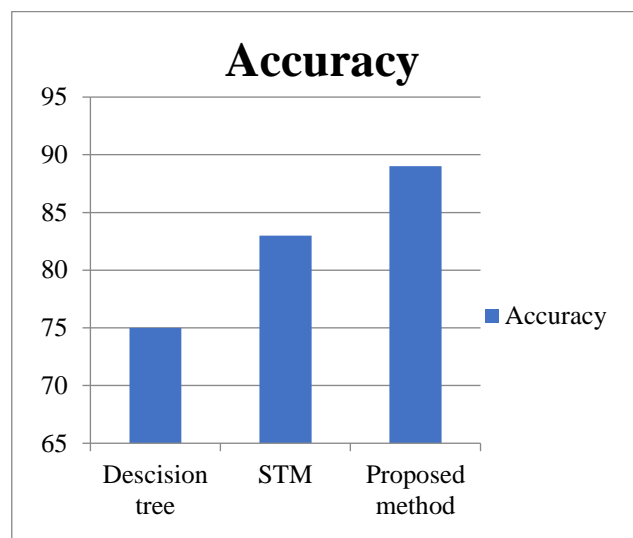

Fig 3: prediction accuracy

The computation time of our proposed work and existing method is shown below as graph. It shows our proposed method consumes minimum computation time and it increases performance of our system.
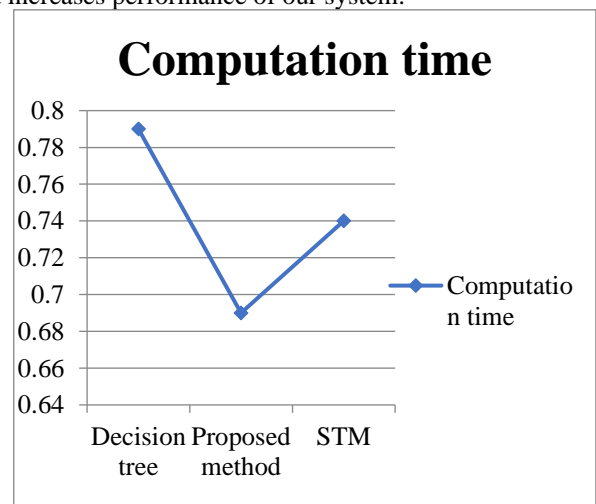

Fig 4: Computation Time Graph

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IV.CONCLUSION

The social network addiction has been increasing day by day and it leads to more issues which causes insecurity to user's life due to its mental pressures. Therefore analyzing user metal stage accurately without disturbing user privacy is an difficult and challenging issue. This has been taken as objective and solution has been identified and implemented. Through application of machine learning NLP was used to understand the meaning of comments shared by user and it identify whether the particular user is in normal or depressed state. By continuous monitoring of user review for a periodic time will make decision that particular user is in depressed state sequential days then it will make a intimation to respective caretaker mail. Through this user mental pressure can be handled by respective care taker and it avoids more critical issues taking place currently.

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