Prediction of Depression via Social Media and Ways to Provide Solution

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ABSTRACT

Depression is common and serious medical illness that negatively affects how individual feels, the way individual thinks and act. Depression affects people from all walks of life, no matter what their background. It can affect people of all ages as well. Usually we can see individuals expressing their feelings on social networking sites (SNS) like Facebook, twitter, You tube, Instagram through the posts, comments, likes, dislikes etc. Data of each individual's activity on SNS can be collected by crowdsourcing. By deep analyzing and understanding these collective data of an individual we can identify positive and negative feelings of an individual. Through this we can come up with the best way of providing solution to depressed individual to overcome mental illness. We can use Naive Bayes algorithm which is a machine learning algorithm, used to classify the depression level into different levels and it also provides doctor's location near to the identified depressed individual. Understanding the latest depression statistics could increase awareness about mental health. Recognizing how widespread it is could also help reduce the stigma- which might encourage more people to seek treatment. Main concern of this survey is to find depressed individuals and approach them with the positive entities. By encouraging the depressed minds with positive joy, happiness, and positive feelings we can help an individual to overcome their negative thoughts and depression.

Keywords: Mental illness, Depression, Social Networking Sites, Naive Bayes.

INTRODUCTION:

Emotion is a fundamental element of human society. Emotion is a mental state variously associated with thoughts, feelings, behavioral responses and a degree of pleasure or displeasure. Positive emotions are naturally healthy for an individual but negative emotion causes negative effects on an individual. Depression is one such mental illness that negatively affects the health of a person. Depression is a serious medical illness that is proportional to depressed individual's ability to work, study, participation in social activities and having fun. According to research, there is no single cause of depression. Depression can be the result of brain chemistry, hormones and genetics as well as life experiences and physical health. In the modern day and age, internet has become an essential for everyone. It is an integral part of every individual's daily routines. One of the most important and popularly rising topics of general interest nowadays is social networking sites (SNS). It is very common for people to use social networking sites (SNS) nowadays to be in regular contact with their friends and relatives over internet. Emotions of people is exhibited on the social networking sites through the posts, comments, likes, dislikes etc. Social networking platform is best way to know person behavior, thinking style, mood, egoistic networks, opinions.

We don't talk much about depression as much as we talk about other diseases, but we will be shocked to know that 300 million people worldwide are suffering from depression. According to World Health Organization (WHO), India is the most depressed country in the world, followed by China and the USA. Who reports the India, China and the US are the most affected countries by anxiety, bipolar disorder and schizophrenia. A study reported in WHO, conducted for the NCMH (National Care of Medical Health), states that at least 6.5% of Indian population suffers from some form of the serious mental disorder. The average suicide rate in India is 10.9 for

every lakh people and the majority of people who commit suicide are below 44years of age. The WHO estimates that 91.8% of all Chinese people with a mental disorder such as depression will never seek help for their condition. It's very shocking to know that Pakistan has only 750 trained psychiatrists, as reported in 2012. One in 6 people aged 10-19 years is suffering from depression. One of the more surprising, and upsetting, uses of social media has been suicides performed on Facebook Live. Though reasons for suicide are complex, the mere thread is often a cry for help, acceptance, or recognition. A new survey finds 90 percent of teens and young adults with depression symptoms turned to digital tech for help or information. New research aims to help create better screening and diagnostic tools for depression by using the information provided by social media. Social media may turn out to be an important tool for diagnosing, monitoring, and eventually treating It can be a step toward improving mental health with social media, says H. Andrew Schwarts. A supervised learning algorithm can predict clinical depression much earlier and more accurately than trained health professionals. Naive Bayes algorithm is one such algorithm that can be used to predict the clinical depression. Once we are able to classify the individuals under depression, we will be able to provide a helping hand to overcome their depression. It is our aim to come up with different ways to reach the depressed individuals and help them to overcome their depression.

LITERATURE SURVEY:

In order to find the depressed individuals through social media we have to completely analyze and understand the behavior of user's. The behavior of user's can be predicted by going through the massive amount of data generated by user's that is User Generated Contents (UGC). There are many researches that have carried out on depression level problem in order to solve it and still there are researches that is going on.

Big data Analytics using Hadoop in [1] plays an effective role in performing meaningful real-time analysis on the huge volume of data and able to predict the emergency situations before it happens. They use the large amount of data generated at health care industry through record keeping, compliance and patient related data, to improve the quality of health care by minimizing the costs. They use big data analytics to discover valuable decisions, by understanding the data patterns and relationship between them with the help of machine learning algorithms. At the health care, big data analytics was used to detect spreading diseases earlier, monitor the hospital's quality, improve the treatment methods.

Twitter as a screening tool in [2] to predict depression level also called Major Depressive Disorder (MDD) or clinical depression. It is a mental disorder characterized by at least two weeks of low mood that is present across most situations. It is often accompanied by low self-esteem, loss of interest in normally enjoyable activities, low energy, and pain without a clear cause. It is unipolar disorder which is characterized by persistent feeling of sadness. It is implemented by using CES-D (Centre for Epidemiologic Studies Depression Scale) screening test in order to minimize the depression. They used crowdsourcing to collect assessments from several hundred Twitter users who report that they have been diagnosed with clinical MDD. They showed that individuals with depression show lowered social activity, greater negative emotion, high self-attentional focus, increased relational and medical concerns. Finally, they build SVM (Support Vector Machine) classifier that can predict depression of individuals. They were yielded promising results with 70% classification accuracy.

Depression affects most of the people over worldwide leading to suicide [3]. They focus only on the detection of mental state of social media users. They aim to study the techniques used by the researchers so far to predict mental state of public. They show that most of the work is based on the input collected from the clients using questionnaire. They use the usage pattern of social media users, their time of usage, their posts, and other social activities to identify the mood of user which can be very helpful to analyze the mental state of the users and predicting depression.

Instagram as a screening tool in [4], to predict depression using photographs posted. They identified that markers of depression are observable in Instagram user behavior. They predict the depressive signals from posts made by depressed individual prior to the date of first clinical diagnosis. They used crowdsourcing for data collection using Amazon's Mechanical Turk (M Turk) crowd work platform. They used the CES-D (center for epidemiologic studies depression scale) questionnaire to screen participant depression levels. They made hypothesis to distinguish the depressed individuals from healthy ones. As a, result they found that the pre-diagnosis and all-data confidence levels were largely identical with two exceptions: pre-diagnosis brightness decreased to 90% confidence, and pre-diagnosis posting frequency dropped to 30% confidence. They observed that the photos posted by depressed individuals tended to be bluer, darker and grayer. They also observed that more comments were passed by depressed users and less likes were received. Depressed users posted photos with face, but had a lower average face count. Less filters were applied to posted photos by depressed users.

EXISTING APPROACH:

The test for depression detection often are based on interaction of patient with a psychiatrist which involves physical presence of the patient. Psychological treatments can help depressed individuals to change their thinking patterns and improve their coping skills. The medical science relies on asking the patients questions about their situations, behaviour reported by his relatives or friends, which does not diagnose the depression in a precise way. the result was not so qualitative and accurate. There are many SNS, foundations, helplines, available to help depressed individuals to overcome their depression. Most of the people use social media to express their feelings, emotions, and what are they doing on their daily routines. From user's profile in Social media, we can collect all the information that relates to person's mood, activities, sleep hours, thinking style, interactions, guilt feeling, worthlessness, loneliness, and helplessness. Existing works demonstrated that leverage social media for healthcare, and in particular stress detection, is feasible. There are some limitations exist in Facebook content-based stress detection. Users do not always express their stressful states directly in Facebook post. Although no stress is revealed from the post itself, from the follow-up interactive comments made by the user and her friends, we can find that the user is actually stressed from work. Thus, simply relying on a user's Facebook post content for stress detection is insufficient.

PROPOSED IDEA:

There are several numbers of approaches to help an individual to overcome his or her depression. The idea that we propose involves the personal identification details of depressed users provided by users at SNS. We are able to identify the depressed individuals through social media by using crowdsourcing. As we know each and every user have to provide their identification details to effectively use the SNS like Facebook, Instagram etc. Since, the personal information details of users are already provided by users themselves, we can collect the identification details of users under depression by using crowdsourcing. The personal identification details of user can be their contact number, e-mail id etc. Even if we are capable of segregating the depressed users' profile, it does the job. Once we are able to get the personal identification details of individuals under depression successfully, it is our next step to provide a helping hand to individuals to overcome their depression. We use personal identification details to help the depressed individuals. We can send an e-mail to the provided e-mail id of depressed individuals. This e-mail may consist of positive text messages, positive thoughts, images, quotes etc. This may help to enhance the feelings of a person from negative feelings towards positive feelings. We can post some positive texts, quotes on the individuals feed in Facebook, Instagram etc., on daily basis.

The way we approach to help the depressed individuals matter a lot. But more than that it is very important to identify the depressed individuals in the first place. A number of different researches in depression detection involve analysis of dataset to predict the abnormal behaviour and suicidal thoughts among individuals. The motive of these techniques is to use the data which is available on twitter and other social media platforms such as Weibo for predicting the nature and the mind-set of individuals via analysing their various social media posts. People tend to open up and share their feelings with the help of SNS such as Facebook, Instagram, Twitter by posting blogs, photos and exchanging messages. They share their thoughts, feelings, emotions, feelings of guilt, worthlessness, helplessness and egoistic nature of individual etc. Whatever they post is related to their daily activities & happenings. Social media helps to know about individual's thinking, mood, activities & socialization. Many researchers have been proving that social media can be effectively used to uncover the depression states of the people and maintain people's mental health. Here we make use of social media such as Facebook, Instagram, twitter to identify the depressed individual. We can develop a model that can be used to predict the depression of individuals. Predicting Depression Model can be created using RapidMiner. The model consists of a number of processes to test both of classifiers, SVM classifier, and Naïve Bayes classifier. The model consists of two datasets. The first dataset is the training dataset which contains the manually trained 2073 depressed posts and 2073 not-depressed posts. The second dataset consists of the patient SNS posts and it is changed for every individual to test the prediction of the model. In addition, the first dataset consists of three columns, the first one is binominal sentiment (Depressed, Not-Depressed), the second column contains the depression category (One out of the nine category in case of depressed sentiment), and the third column contains the trained post.

To diagnose with major depressive episode, the individual will have five or more of the following nine symptoms during the period of two weeks and nearly every day.

- The first symptom is having depressed mood most of the day.
- The second is losing interest in almost all activities.
- The third symptom is weight loss or weight gain and sleeps too much

- The fourth symptom is body agitation or retardation.
- The fifth is feeling tired or loss of energy.
- The sixth is feeling of guilt or worthlessness.
- The seventh symptom is finding concentration, thinking, or making a decision becomes a difficult task.
- The eighth symptom is trouble having sleep or sleep too much.
- The ninth and last symptom is the only symptom that does not have to exist nearly every day, the symptom is thinking about death, suicide attempt, or planning to commit suicide.

The first operator among the seven main operator of the model is the Select Attributes which selects which attributes of the training dataset should be kept and which attributes should be removed. The second and the third operators are the Nominal to Text, this operator changes the type of selected nominal attributes to text. The fourth and the fifth process are Process Documents and it is used in the training dataset and the test set which generates word vectors from string attributes and it consists of four operators. The four operators of Process Document operator are Tokenize, Filter Stop-words, Transform Cases, and Stem. The Tokenize operators splits the text of a document into a sequence of tokens. The filter Stop-words filters English stop words from a document by removing every token which equals a stop-word from the built-in stop-word list in the RapidMiner. The Transform Cases operator transforms all characters in a document to lower case. The Stem operator stems English words using the Porter stemming algorithm intending to reduce the length of the words until a minimum length is reached. The sixth operator is the Validation operator which contains which applies on the training dataset which consists of two main sections, training, and testing. Training section contains the classifier operator, and we change the classifier model from SVM (Linear) to Naïve Bayes Classifier (Kernel) each time we test patients. The testing section consists of Apply Model operator which applies the trained model on the supervised dataset and the Performance operator used for performance evaluation. The seventh and last operator is Apply model which connect the test dataset and training dataset to give us the final result of the prediction using one of the classifiers in the patients. The accuracy of the classification depends on the training set used to run the classifier. It is, therefore, good practice to get as many different kinds of samples in the training set as possible. The posts of the dataset were collected out of three SNS, Facebook, Instagram, and Twitter.

Once we are able to get the personal identification details of individuals under depression successfully, it is our next step to provide a helping hand to individuals to overcome their depression. We use personal identification details to help the depressed individuals. We can send an e-mail to the provided e-mail id of depressed individuals. This e-mail may consist of positive text messages, positive thoughts, images, quotes etc. This may help to enhance the feelings of a person from negative feelings towards positive feelings. There are several numbers of online websites which has come up to help people to come out of their depression. We can refer these online websites to people under depression through e-mail, text messages to individuals Facebook, Instagram accounts. Nearest medication centre's details can be provided to depressed individual in the form of ads. We can advertise the location of nearest medication centre's available. We can post some positive texts, quotes on the individuals feed in Facebook, Instagram etc., on daily basis.

Short videos with positive feelings can be uploaded to the feed page of users account in the form of advertisements. We can refer the pages with full of positive ideas to the users in Facebook, Instagram etc. Posting some positive thoughts on the individual page may help to overcome their mental illness. We can lend the details of depressed individuals to trusted organization that are concerned with providing help to people to move from dark side of their life to the bright full future. We can also try to implement the developed model in co-ordination with the social networking sites. By doing so there will be no need of collecting the personal details of individuals. The developed model or system by itself can predict whether the individual is under depression or not and it can automatically post some positive texts, quotes on the individuals feed in Facebook, Instagram etc., on daily basis. It can automatically upload short videos with positive feelings on the feed of users account. It can automatically refer some pages with full of positive ideas to the users in Facebook, Instagram etc. Nearest medication centre's details can be automatically provided to depressed individual in the form of ads.

CONCLUSION:

Depression is common but serious mood disorder. Most of the people use social media to express their feelings, emotions, and what are they doing on their daily routines. From user's social activities, we may get closer to the natural behavior of the depressed individuals and his/her way of thinking, and better classify the mental levels. We can identify and collect the personal identification details of depressed individuals by using naïve Bayes

algorithm and crowdsourcing on SNS. Using these details, we can lend a helping hand to depressed individuals to overcome their depression by posting the posts with positive feelings, by referring nearest medical centre's in the form of advertisements. We may be able to give a small hope to individuals about life. Doing this we will be able to give a helping hand supporting the society to move one step ahead towards artistic, colourful and bright future.

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