

Psychological Illnesses Revealing Method Using Machine Learning

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Abstract:

A rising amount of Social Network Mental Disorders (SNMDs) are newly noted. One of the key solutions to this problem is detailed study of individual's behavior attributes. These behavioral attributes can be extracted from various social networking sites such as Twitter, Facebook, etc. Social networking platform is best medium to know person's behavior, thinking pattern, mood, opinions etc. The individuals on social media express their feelings, daily activities and opinions regarding various topics. So, social networking sites are used as screening tool to predict mental disorder stages. People opinions could be positive, negative or neutral. In order to determine mental disorder stages, person's negative response is significant because it tells us about the negativism. Earlier method of diagnosis of patient through just psychological questionnaires is not so relevant but by using user generated content on social media definitely helps to predict stages of SNMD of particular individual. Our project aim is to extract information from social media posts and by having clear understanding of person's behavioral attributes and attempted questionnaires, mental disorder stages of user can be detected. By using machine learning algorithm such as Naive Bayes, mental health status of a user is classified into three SNMD stages like stage 1, stage2, stage3. The results manifest that Social Network Mental Disorder Detection (SNMDD) is capable for identifying and distinguish online social network users with potential SNMDs from user not having mental disorder.

Keywords:

Naïve Bayes Classifier, Social Network Activities, Text Mining, Anomalies, UGC (User generated Content)

Introduction:

Web application is a part of this project. In this project the social media posts, scores of questionnaires, number of logging attempts, trolls, duration of usage are considered. Social Network Media (SNM) is a source of data and screening tool to classify the users as per the user's social media activities mentioned above. By using machine learning algorithms like Naïve Bayes, we present a machine learning framework, namely, Social Network Mental Disorder Detection (SNMDD) that exploits features extracted from social network activities to exactly identify potential cases of SNMDs. As mental illness is extremely significant issue which is increasing day by day, many people are suffering from this problem. In India, out of total population 7.5% population is facing this problem. It seems to be major issue and that is the reason it motivate us to worked on

it. Earlier diagnosis of mental disorders were done on basis of self-revealing psychological questionnaires and patient's behavior reported by his relatives or friends. But the result wasn't so qualitative and accurate. In contrast thereupon, social media is powerful tool for detecting whether a person has mental disorder or not, if yes then that individual is classified into three stages of mental disorder depending upon his/her social media activities. Recently usage of social media platforms like Facebook, Twitter is increasing, where, users share their thoughts, feelings, emotions, feelings of guilt, worthlessness, helplessness and egoistic nature of individual etc. Users' posts are related to their daily activities & happenings. Social media can be the source to understand individual's thinking, mood, activities & socialization. So by analyzing the social media data & applying some algorithms on it, we can be able to determine the stage of social network mental disorders of that particular individual. So it will assist to diagnose the victim before he/she gets more affected to it. This motivates us to do the project, so that this will help not only to psychiatrist but can also be employed by individuals who want to do self-diagnosis.

Motivation:

In recent years, social media has become increasingly popular, and therefore both large-scale and fine grained records of users' activities are available. As objective information for identifying mental health status in individuals, we focus on large-scale records of users' activities in social media. We can use comments, duration of login Session, remarks, trolling as social media user's activities to classify the users according to user generated contents (UGC). By using machine learning algorithms such as Naive Bayes, user is classified into different stages of mental disorder. The purpose of the system is to detect anomalies or an abnormal event that occurs on social media like twitter by using text streams. This system is able to notice anomalies at an earlier stage compared to the obtainable methods.

Related work:

In [1] it has been reviewed using social media to predict mental illness. Symptoms associated with mental illness are observable on social media platforms like Twitter, Facebook, and web forums. Mentally disturbed users were recognized through screening surveys, their public sharing of a diagnosis on Twitter, or by their membership in an web forum, and that they were distinguishable from normal users by patterns of their language in posts and online activity.

They have proposed a system in [2] that used the potential of using Twitter as a tool for measuring and predicting major depression in individuals. Initially crowd sourcing was used to classify on depression. They proposed a variety of social media measures like language, emotional involvements, ego network, and user engagement to characterize depressive behavior. The findings showed that patients with depression show lowered social activity, higher negative emotion, greater self-attention focus, elevated relational and medicinal concerns, and heightened expression of religious thoughts. They have used SVM classifier that can predict,

ahead of the reported onset of depression of an individual i.e. user's likelihood to depression. The classifier yielded results with 70% classification accuracy.

The system have been proposed in [3] for emotion analysis of tweets using only the core text. Tweets are usually short, more ambiguous and contain a huge amount of noisy data; sometimes user's opinions are not clearly understandable. Most of the researches in this topic have been focused on binary (positive and negative) and 3-way (positive, negative and neutral) classifications. In this system, they have focused on classifying emotions expressed through tweets into multi-class classification. The basic human emotions (happiness, sadness, surprise, disgust) and neutral were chosen as emotion classes. A technique for emotion analysis of tweets using unigram model and unigram model with POS tags for feature extraction were implemented. It has used Bag of Words Model. Naïve Bayes classifier is used for classification of emotions. The emoticons, URLs, targets, punctuation, stop -words were removed to simplify and make the classification more accurate. According to the experimental results, this approach improved the performance of multi-class classification of twitter data.

They present the sentiment analysis for language learning using machine learning algorithm- Naïve Bayes Classifier in [4]. Their proposed system was used for Facebook social media platform. They mainly focus on user's Facebook status updates. It does not include any facebook posts like photo stories, application stories etc. They used Naïve Bayes algorithm for classifying the \status into positive or negative status. Their system also extract emoji's which helps to understand person's emotions. Accuracy of system was so high due to used of Naïve Bayes algorithm.

Proposed Work:

We build an attempt to recognize potential online users with Social Network Mental Disorders (SNMDs) without human intervention. We propose the Social Network Mental Disorder Detection (SNMDD) framework that explores the various features from data logs of Online Social Networks (OSNs) for detection of various stages of SNMDs. This effort represents correlated effort among computer scientists and mental healthcare researchers to point emerging issues in SNMDs. Though feelings are hard to articulate but online self-expression provides a means to convey a mental condition into a physical form. Social Media can facilitate early diagnosis of a clinical mental health condition related to anxiety, depression or any other symptoms related to SNMDs in active extroverts who verbalize and share their internal restlessness. As for the next step, we plan to study the features extracted from multimedia contents by techniques of NLP. We also plan to further explore new issues from the viewpoint of a social network service provider, e.g. Twitter or Facebook, to improve the well-beings of OSN users without compromising their mental health.

In our proposed system there are two main modules User and Admin. The Social user will add post, update their profile, add or remove friends, upload their profile picture and view profile of other users. The other Admin module will evaluate the activities of all users to find out the rational disorder personality on social media. Admin

can access user's data. Each user's data consists of name, date of account creation, account details, language, description and tweet count. For each user, tweets are fetched, with date and time of post, mentioned users.

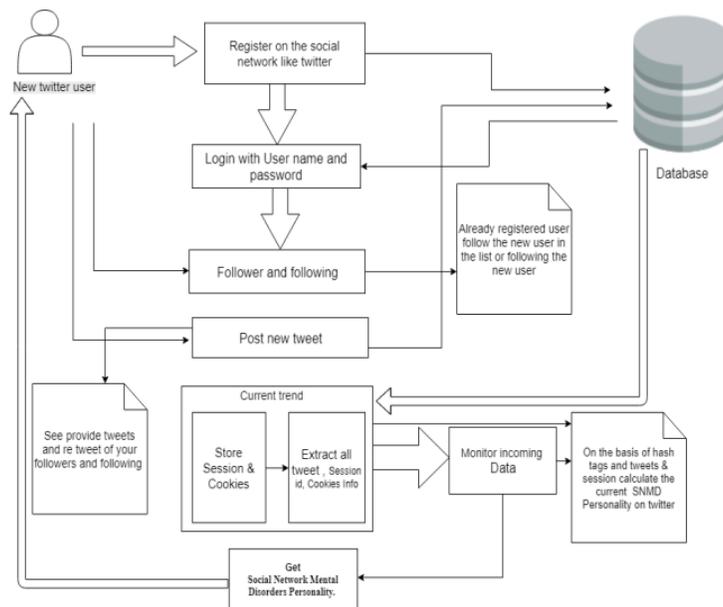


Fig.1: Proposed System Architecture

We build a challenge to robotically recognize probable online users with SNMDs. We put onward an SNMDD construction that amble approximately stages of mental disorder if detected in any individual. The feature vector for building the learning model is trained using a 4-tuple vector <negative words, timings of post, frequency of posting comments, negative sentiments, scores of questionnaire>. The above mentioned features are recorded and analyzed to detect mental disorder in social media users. The given features are presence or absence of disorder related word using the word bag ,more than 2 posts during odd hours of night, specifically between 12am to 6am, more than 3 posts in an hour during anytime of the day , more than average posts in 30 days with negative polarity, scores of questionnaires of the users solved during registration. Using this features extracted from social media activities user is classified into stage1, stage2, stage3 of mental disorder if individual reflects symptoms of mental disorder through social media usage activities, this is done using Naïve Bayes, machine learning algorithm.

Conclusion:

Now a day's we are well-known with the trends of social media such as Facebook, twitter where users post their opinions, perform various other social media activities that reflect their mental health status which can be analysed to detect various stages of mental disorder. Psychological stress is threatening people's health. Therefore we presented a framework for detecting users' psychological health status from users' social media data, leveraging twitter post content as well as users' social interactions. Employing real-world social media data as the basis, the project goal is to develop a web application which takes social media posts and questionnaire test as input and detect output as various stages of mental disorder. Using Naïve Bayes

algorithm to increase accuracy of the system. According to user's social media activities system can find out user is having mental disorder or not. Social media can help to improve individuals' sense of connectedness with real or online communities and become aware of SNMDs.

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