Study of Mental Disorder Detection Based on Machine Learning Techniques

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Abstract: *The explosive growth in popularity of social networking leads to the problematic usage. An increasing number of social network mental disorders (SNMDs), such 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 status cannot be directly observed from online social activity logs. In this paper presented latest studies indicate a relationship between mental health and the actions of the social network and how mental illness and social networks respond to each other is still unclear. This paper attempts to use the data analysis of social network research to find a pattern for mental disorders without consulting the patient based on machine learning algorithms.*

I. INTRODUCTION

Social media has the means folks perform the communication. Now a day's each and every person use the Smartphone's, tablets through which they always connect to the social media. Due to the drastic development in the popularity of social networking and messaging apps online social network have become a part of many people daily lives. People almost addicted by these online social media apps.There are many advantages of social media such as it helps to connect with the people, provide easy and instant communication, give real time news and updates, provide great opportunity for business, and

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give fun and enjoyment. Similarly have a many disadvantages such as, information overwhelming, privacy issues, social peer pressure or cyber bullying, substitution for the offline interaction and affects lifestyle of the people.

Addiction typically refers to compulsive behavior those results in negative effects. In most addictions, people feel compelled to do certain activities thus typically that they become a harmful habit, that then interferewith different vital activities like work or faculty.In that context, a social networking addict could be considered someone with compulsionto use social media to excess constantly checking Facebook status updates or "stalking" people's profiles on Facebook, for example, for hours on end. But it's exhausting to inform once fondness associate in nursing activity becomes a dependency and crosses the road into a harmful habit or addiction. Researchers at Chicago University all over that social media addiction will be stronger than addiction to cigarettes Associate in nursing booze following an experiment within which they recorded the cravings of manyhundred people for several weeks. Media cravings stratified prior to cravings for cigarettes and alcohol. At university, researchers actually hooked people up to functional MRI machines to scan their brains and see what happens when they talk about themselves, which is a key part of what people do in social media. They found that self-disclosure communication stimulates the brain's pleasure centers very like sex and food do. Plenty of clinicians have determined symptoms of tension, depression and some psychological disorders in people who spend too much time online, but little hard evidence has been found proving that social media or net use caused the symptoms. There's a similar lack of knowledge regarding social networking addiction. Some people consider excessive use of social networks simply the latest form of "Internet Addiction Disorder," a phenomenon people first began writing about in the 1990s when Internet use was starting to spread. Even in the past, folks the orized that serious use of the net may impair people's performance at work, in school, and in family relationships. Nearly twenty year slater, there's still no agreement that excessive use of the net or social networking services is pathological or ought to be thought of a medical disorder. Some have asked the Yankee Psychological Association to feature web addiction to the official medical bible of disorders; however the APA has up to now refused. If you're speculative, though, whether you may be disbursal an excessive amount of on-line, attempt taking the net addiction

check. Excessive use of social networking apps social network mental disorders are detected such as phantom ringing syndrome, Nomophobia, cyber sickness, Internet addiction disorder, Online gaming addiction, Cyberchondria etc. A psychological disorder additionally referred to as a mental state or psych iatrical disorder could be a activity or mental pattern That causes vital distress or impairment of nonpublic functioning.Such options could be persistent, lapse and remitting, or occur as a single episode. Many disorders are represented, with signs and symptoms that vary widely between specific disorders. Such disorders are also diagnosed by a psychological state skilled.

Social network mental disorders results in users can experience FOMO-Fear of Missing Out. This is where people feel that others are having fun without them. People may expertise anxiety as a result of they don't feel good enough, as attention-grabbing as, or as sure-fire as others. According to social man of science Ethan Kross, the lead author of a University of Michigan study, -On the surface, Facebook provides a useful resource for fulfilling the fundamental human would likefor social connection. But instead of enhance well-being, we tend to found that Facebook use predicts the other result-it undermines it.This is despite the number of Facebook friends, how supportive they were, or why they logged on to Facebook. The study additionally found that the lot of individuals used Facebook, the lot of their moods born. Researchers have reported that the social network mental disorders may incur excessive use, dejection, social revocation, and a range of negative influence. Indeed, these symptoms are important components of diagnostic criteria for detecting social network mental disorders:

1) Excessive use of social networking and messaging apps usually associated with a loss of the sense of time or a neglect of basic drives;

2) Detection – including feelings of anger, tension, and/or depression when the computer/apps are inaccessible;

3) Balance – manifesting as the need for more usage; and

4) Negative Revocation – including arguments, lying, social isolation, and fatigue. Social network mental disorders are social-oriented and tend to happen to users who usually interact with others via online social media. Those with social network mental disorders usually lack offline interactions, and as a result seek cyber-relationships to compensate.

II.   MENTAL DISORDERS STUDIED

National Alliance of Mental Health (NAMI) states that "a mental illness is a condition that impacts a person's thinking, feeling or mood may affect and his or her ability to relate to others and function on a daily basis" (NAMI, 2015). Depression and schizophrenia are the most common types of mental illnesses in the world.

"Mental health disorders such as depression are among the 20 leading causes of disability worldwide. Depression affects around 300 million people worldwide and this number is projected to increase. Fewer than half of those people affected have access to adequate treatment and health care" (WHO, 2015). Following are the types of mental disorders as per WebMD: anxiety disorders, mood disorders, psychotic disorders, eating disorders, addiction disorders, personality disorders, obsessive compulsive disorders (OCD), Post-traumatic Stress disorders (PTSD) etc. We will be focusing on following major disorders below. WebMD (WebMD, 2015a) provides definitions of these disorders as follows:

Anxiety Disorders: "People with anxiety disorders respond to certain objects or situations with fear and dread, as well as with physical signs of anxiety or panic, such as a rapid heartbeat and sweating. It includes generalized anxiety disorder, panic disorder, social anxiety disorder and specific phobias."

Mood Disorders/Affective Disorders: "It involves persistent feelings of sadness or periods of feeling overly happy, or fluctuations from extreme happiness to extreme sadness. The most common mood disorders are depression, bipolar disorder, and cyclothymic disorder. Depression includes major depression, persistent depression, seasonal affective depression which is caused due to change in the season, psychotic depression etc."

Psychotic Disorders: "Psychotic disorders involve distorted awareness and thinking. Two of the most common symptoms of psychotic disorders are hallucinations -the experience of images or sounds that are not real, such as hearing voices -and delusions, which are false fixed beliefs that the ill person accepts as true, despite evidence to the contrary. Schizophrenia is an example of a psychotic disorder."

A. Components of Social Network Mental Disorder

Mental disorders manifest in several ways that cover various degrees and areas of internet usage. Most of the mental disorders due to the prolonged use of internet can be grouped into following categories:

Net Compulsion / Internet Addiction: Too much time spent in online gaming, trading, gambling often leads to financial loss and can also hinder professional life and may develop mental health issues like depression.

Information Overload / Information Glut: It includes consistent seeking large amount of online information which

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makes difficult to separate fact from friction. It also comprises constant online browsing, checking user status and newsfeeds that lead to lesser social interactions with friends and family and results in inefficiency and decreased productivity at work.**Cyber Relationship Addiction:** Virtual relationships with social network connections grow to be serious which result in neglecting real life friends and family.

Cyber Sex Addiction: It also includes compulsive - obsessive need to find sexual gratification and compel users to surf porn sites which in turn has a detrimental effect on real-life relationships.

Computer Addiction: Compulsive game playing on computer online/offline without realizing its health hazards.

IAD (Internet Addiction Disorder): IAD, otherwise referred to as Dangerous use of the Internet or excessive web utilize is irrational use of the internet which affects daily life. It's kind of Web-dependent patient dependence, much same as drug or liquor compelling. Several study mechanisms in Brain Study and Neuroscience have investigated the indispensable workings, possible consequences IAD relations. Any adolescent possesses network dependency prob. at early age, it becomes necessary for test the suicidal possibility among Network enslavements. Experts conducts various tests that explore the relations between social and teenage Internet dependence

Linear Dynamic General Models:A system for an efficiency assessment of the possibility of mankind in ICU. A framework based on linear regression Dynamics Frameworks that design the risk of survival as transient condition that evolves over time. One such structure enables us to integrate different skin textures in one linear phase (laboratory results, learning of evidence of life, physician's and nursing notes, and alike which are presented with latest patient information. The new method utilizes phrase selection and mathematical theme template to remove the content functionality from of the consumers. However, it is not necessary to record numerical terms within file. The textual functions focused on material emerge through user created knowledge for emotional interpretation and topic recognition.

SNS (Social Network Site) Advent: There are 2 types that are relational and regular check in their interaction with the SNS. Consensual partnerships, which are focused on reciprocal relationships seen between consumer and associates of a person who uses social networking to tell the regular consumer of celebrity activity (e.g., famous celebrities, athletes, etc.) but just not put more simply. Folks easily preserve pre-existing social ties and make connections online. However, this technical aspect of SNSs offer range opportunities for individual and

collective gains, they can also negatively affect the consumer. Many researchers are of the view that this SSN will make a patient dependent, experience isolation and remove themselves from society. Distinguishes forms of SNS interactions in the introduction of SSN paper and explores their communal relations with others

Internet Craving's Psychosomatic Confusion: The latest psychosomatic confusion of internet addiction has become easy to recognize both fashionable and technological. Throughout recent studies, communal media have chosen a alg structure to attract users.It may make them feel isolated, timidity, anxiety, insecurity and self-awareness, but its visible they are unified mostly on Web unrequited love condition. Information are now easily usable for web access and build a comfortable social networking atmosphere
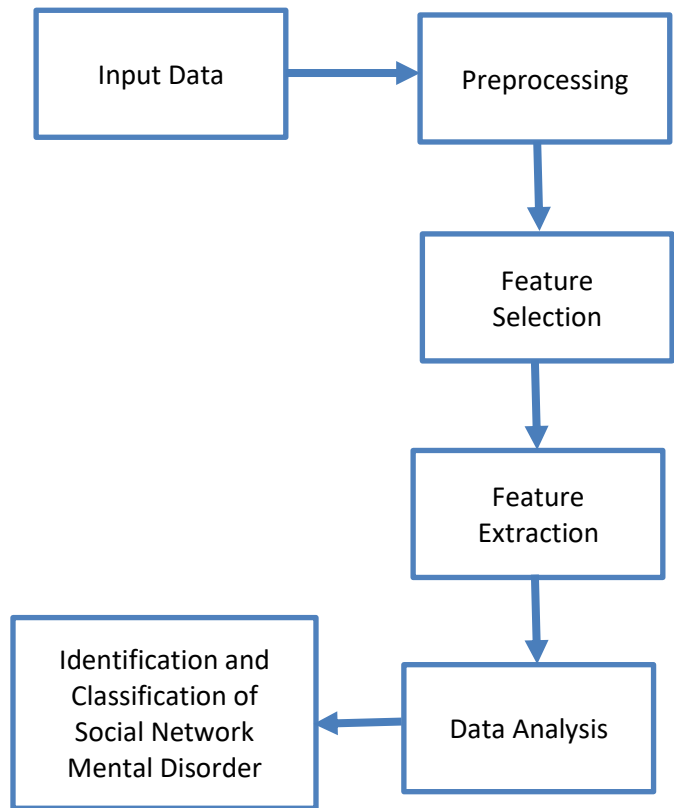

Figure 1: General Framework of Automation of SNMD

III.   LITERATURE REVIEW

Sangeeta R.Kamite et. al. 2019, designed machine learning method for the process of obtaining big data from user generated content on social media sites in order to extract patterns, and act upon the information and argue that mining social behavior provides an opportunity to actively identify

social network mental disorder at an early stage. It is difficult to discover the social network mental disorder

Binti Kholifah et. al. 2020, suggested five criteria that can serve as benchmarks for detecting mental illness from a Twitter user statement. The goal is to calculate the frequency with which words appear in a lexicon. Our results show that the use of sentiments analysis, emotions, and negative words contained in a statement are very influential in determining a person's level of depression. All optimizers obtain the same level of accuracy equal to 70.89%.

Hong-Han Shuai et. al. 2018, work represents a collaborative effort between computer scientists and mental healthcare researchers to address emerging issues in SNMDs. As for the next step, we plan to study the features extracted from multimedia contents by techniques on NLP and computer vision. Plan to further explore new issues from the perspective of a social network service provider, e.g., Facebook or Instagram, to improve the well-beings of OSN userswithout compromising the user engagement.

Punam B. Nalinde et. al. 2019, proposed a system of psychological disorders detection (PDD) that can provide online social behaviour extraction. Propose system a machine learning approach that is detection of psychological disorders in social networks and social interaction features from social network data for detect with precision possible cases of disorders detection. The proposed method could help in developing a social network diagnostic tool for stress detection. It is useful in the diagnosis of psychological disorder detection in social platforms.

Teena Patidar et. al. 2019, proposed a machine learning framework, namely, Social Network Mental Disorder Detection (SNMDD), that exploits features extracted from social network data log file to accurately identify potential cases of SNMDs. Conduct a feature analysis, and also apply SNMDD on large-scale datasets and analyze the characteristics of the three SNMD types. The results manifest that SNMDD is promising for identifying online social network users with potential SNMDs.

Meghana M. et. al. 2019, proposed model stands out in the list as the users are not involved in revealing their habits to understand and diagnose the symptoms manually. We also exploit multi-source learning in SNMDI (Social Network Mental Disorder Identification) and propose a new SNMDbased Tensor Model (STM) to improve the accuracy. The results show that SNMDI is reliable for identifying online social network users with potential SNMDs.

Amir Hossein Yazdavar et. al. 2020, presented an in-depth analysis of visual and contextual content of likely depressed profiles on Twitter. Employed them for demographic (age and gender) inference processes. The empirical evaluation shows that our multimodal framework is superior to them and it improved the average F1-Score by 5 percent. Effectively, visual cues gleaned from content and profile images shared on social media can further augment inferences from textual content for reliable determination of depression indicators and diagnoses.

Summary : After reading the aforementioned literature, we observed that there are a variety of techniques and methods designed to predict the mental health condition of person. There are different methods used in classification of texts. Most of them are based on word and phrase classification. The machine-learning approach is very commonly used in which data are trained on specific data set and then tested on different datasets.

IV. SOCIAL NETWORK MENTAL DISORDER DETECTION

In this paper, we present the study of machine learning framework to detect the social network mental disorders:

1) Nomophobia which includes, anxiety that arises from not having access to one's mobile device. The term Nomophobia‖ is associate degree abbreviation of -no-mobile anxiety disorder.
2) Cyber sickness which has, disorientation and vertigo some individuals feel once interacting with bound digital environments.
3) Internet addiction disorder, which includes, a constant and unhealthy urge to access the Internet. Online gaming addiction which includes an unhealthy need to access online multiplayer games.
4) Cyberchondria which includes, the tendency to believe you have diseases you read about online.

Table 1: Some Posts that Indicate Depression

Depression Indicative Posts
-Hey bro, what happen, is everything fine or not? No…. Nothing is fine, I don't understand why only I...why people always cheat only me…
Everyone taunts only on me….Why…I m fed up of this.
I wish I have someone that cares for me, understands me, love me… I'm Sad.
I lost my interest in all activities...I don't like anything...I want to be alone...
Why I m not a first priority for a people….this makes me cry
How is that possible...how I can fail...I don't know what to do...there is no reason for me to alive….
I diagnosed with Depression last week.
I m fed up of all this, why can't people leave me alone, why they interfere all the time.

In the table 1 we mentioned some of the comments that indicates Depression, and that are used by the people when they are not mentally well, and that and taken by the researcher hers to predict the user's mental state. For Example: -Hey bro, what happen, is everything fine or not? No…. Nothing is fine, I don't understand why only me. Why people always cheat only me…This comment indicates that a person is very disturbed and is close to Depression. -How is that possible...How I can fail...I don't Know what to do...there is no reason for me to alive…. this Comment indicates the Sodality.

We pursue to accomplish our complete method through:

1) Collection of Data
2) Cleaning and preprocessing of Data
3) Extracting Features

Through manipulating machine learning techniques with the ground truth found via the current analytical repetition in Psychology, we extract and analyse several features of different categories from Social Network Mental Disorder, including para-social relationships, online and offline interaction ratio, social capital, disinhibiting, self-disclosure, and bursting temporal behaviour. These features capture important factors or serve as proxies for disorder detection.
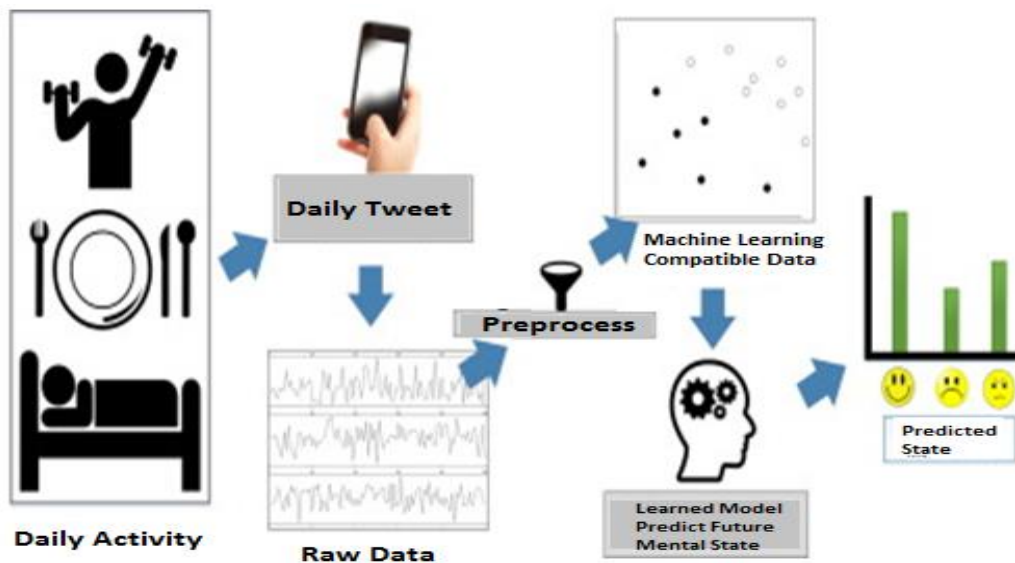

Figure 2: Proposed System

V. CONCLUSION

To conclude, our system has presented a novel approach to analyze different mental disorder cases such as Depression, Anxiety Disorders, SAD, Happy, Elated, Angry, Irritable, Energetic, Anxious and seasonal affective disorder. The objective was to offer a platform which is fast, accurate and flexible to identify users and analyze patterns of their writings in terms of language and sentiment.

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