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A Major Project on

"MINING ONLINE SOCIAL DATA FOR DETECTING SOCIAL NETWORK MENTAL DISORDERS"

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ABSTRACT

The explosive growth in popularity of social networking ends up in the problematic usage. An increasing number of social network mental disorders (SNMDs), like Cyber-Relationship Addiction, Information Overload, and Internet Compulsion, have been recently noted. Symptoms of these mental disorders are usually observed passively today, ensuing in delayed clinical intervention. During this Project, we tend to argue that mining on-line social behavior provides a chance to actively establish SNMDs at an early stage. It is challenging to detect SNMDs as a result of the mental standing cannot be directly observed from on-line social activity logs. Our approach, new and innovative to the observe of SNMD detection, does not rely on self-revealing of these mental factors via questionnaires in Psychology. Instead, we have a tendency to propose a machine learning framework, particularly, Social Network Mental Disorder Detection (SNMDD), that exploits features extracted from social network information to accurately determine potential cases of SNMDs. We have a tendency to also exploit multi-source learning in SNMDD and propose a brand new SNMD-primarily based Tensor Model (STM) to enhance the accuracy.

CHAPTER – 1

INTRODUCTION

With the explosive growth in popularity of social networking and messaging apps, online social networks (OSNs) have become a part of many people's daily lives. Most research on social network mining focuses on discovering the knowledge behind the data for improving people's life. While OSNs seemingly expand their users' capability in increasing social contacts, they may actually decrease the face-to-face interpersonal interactions in the real world. Due to the epidemic scale of these phenomena, new terms such as Phubbing (Phone Snubbing) and Nomophobia (No Mobile Phone Phobia) have been created to describe those who cannot stop using mobile social networking apps.

In fact, some social network mental disorders (SNMDs), such as Information Overload and Net Compulsion, have been recently noted. For example, studies point out that 1 in 8 Americans suffer from problematic Internet use. Moreover, leading journals in mental health, such as the American Journal of Psychiatry, have reported that the SNMDs may incur excessive use, depression, social withdrawal, and a range of other negative repercussions. Indeed, these symptoms are important components of diagnostic criteria for SNMDs e.g., excessive use of social networking apps – usually associated with a loss of the sense of time or a neglect of basic drives, and withdrawal – including feelings of anger, tension, and/or depression when the computer/apps are inaccessible. SNMDs are social-oriented and tend to happen to users who usually interact with others via online social media. Those with SNMDs usually lack offline interactions, and as a result seek cyber-relationships to compensate. Today, identification of potential mental disorders often falls on the shoulders of supervisors (such as teachers or parents) passively. However, since there are very few notable physical risk factors, the patients usually do not actively seek medical or psychological services. Therefore, patients would only seek clinical interventions when their conditions become very severe. However, a recent study shows a strong correlation between suicidal attempt and SNMDs, which indicates that adolescents suffering from social network addictions have a much higher risk of suicidal inclination than non-addictive users. The research also reveals that social network addiction may negatively impact emotional status, causing higher hostility, depressive mood, and compulsive behavior. Even more alarming is that the delay of early intervention may seriously damage individuals' social functioning. In short, it is desirable to have the ability to actively detect potential SNMD users on OSNs at an early stage.

Although previous work in Psychology has identified several crucial mental factors related to SNMDs, they are mostly examined as standard diagnostic criteria in survey questionnaires. To automatically detect potential SNMD cases of OSN users, extracting these factors to assess users' online mental states is very challenging. For example, the extent of loneliness and the effect of disinhibition of OSN users are not easily observable.3 Therefore, there is a need to develop new approaches for detecting SNMD cases of OSN users. We argue that mining the social network data of individuals as a complementary alternative to the conventional psychological approaches provides an excellent opportunity to actively identify those cases at an early stage. In this paper, we develop a machine learning framework for detecting SNMDs, which we call Social Network Mental Disorder Detection (SNMDD).

CHAPTER – 2

LITERATURE SURVEY

2.1 Inference on literature survey

[1] Poor sleep quality and suicide attempt among adults with internet addiction: A nationwide community sample of Korea, Kiwon Kim1, Haewoo Lee, Jin Pyo Hong, Maeng Je Cho, Maurizio Fava, David Mischoulon, Dong Jun Kim1, Hong Jin Jeo [2017].

The first strong point of this study is that it is one of the few studies to examine and compare the correlation of sleep quality profiles and IA in the adult group. Second, it is the first study to examine the association between poor sleep quality and detailed suicidal behavior in subjects with IA. Third, this study applied the most popular IA scale, the IAT, and it showed a positive association between poor sleep quality and severity of IA.

However, some limitations of this study need to be brought forward. First, this is a cross-sectional study, using questionnaires and interview depending on subjective memory. Recall bias and limitations to objective measurement related to sleep may exist, and even a prior study, which reported that self-reported sleep patterns are similar to those obtained by wrist actigraphy, should be considered. Second, due to its cross-sectional research design, this study may not identify causal relationships between correlated characteristics and IA. Third, careful interpretation should be taken for Internet addiction as a diagnosis has not received widespread acceptance among the psychiatric community and this study used the IAT to measure problematic internet use, omitting the specific content of internet use of the related device. These days, improvement in internet access has provided easy connection to internet, leading to emphasis on the purpose of use and characteristic differences in smartphone addiction and IA.

[2] Subconscious Crowdsourcing: A Feasible Data Collection Mechanism for Mental Disorder Detection on Social Media, Chun-Hao Chang, Elvis Saravia, Yi-Shin Chen [2016].

Mental disorders 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. Our experiments suggest that extracting specific language patterns and social interaction features from reliable patient datasets can greatly contribute to further analysis and detection of mental disorders.

[3] A Framework for Classifying Online Mental Health Related Communities with an Interest in Depression, Budhaditya Saha, Thin Nguyen, Dinh Phung, Svetha Venkatesh.

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 psycho-linguistic 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. Finally, we performed empirical validation of the model on the crawled dataset where our model outperforms recent state-of-the-art baselines.

[4] Predicting Depression via Social Media, Munmun De Choudhury Michael Gamon Scott Counts Eric Horvitz [2016].

Major depression constitutes a serious challenge in personal and public health. Tens of millions of people each year suffer from depression and only a fraction receives adequate treatment. We explore the potential to use social media to detect and diagnose major depressive disorder in individuals. 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. We believe our findings and methods may be useful in developing tools for identifying the onset of major depression, for use by healthcare agencies; or on behalf of individuals, enabling those suffering from depression to be more proactive about their mental health.

2.2 Existing System

Internet Addiction Disorder (IAD) is a type of behavior addiction with the patients addicted to the Internet, just like those addicting to drugs or alcohol. Many research works in Psychology and Psychiatry have studied the important factors, possible consequences, and correlations of IAD. King et al. investigate the problem of simulated gambling via digital and social media to analyze the correlation of different factors, e.g., grade, ethnicity. Report the Internet user behavior to investigate the reason of addiction. Examine the risk factors related to Internet addiction. Investigate the association of sleep quality and suicide attempt of Internet addicts. On the other hand, recent research in Psychology and Sociology reports a number of mental factors related to social network mental disorders. Research indicates that young people with narcissistic tendencies and shyness are particularly vulnerable to addiction with OSNs. However, the above research explores various negative impacts and discusses potential reasons for Internet addiction.

2.3 Proposed System

Our proposed model aims at identifying individuals that may be developing Psychiatric disorders and aid in predicting Addiction categories by the use of sentiment and semantic analysis on user's social media data. Our work is grouped into two steps:

• Determine whether the given user has a Psychiatric disorder: Here we establish a similarity between users classified to have a Psychiatric disorder versus users that do not. Text from publicly available Patients journal is subject to personality determination that provides a threshold to compare the text of social network data of common users and obtain a resemblance factor between the two. If, features of the social user's personality matches with the patient's personality then the user is considered to have possibility of Psychiatric disorder. We will leverage on statistical analysis and IBM Personality Insight tool to demonstrate the relationship between patient's data and general social user data. This function is defined in our Psychiatric Disorder Determination (PDD) algorithm.

• Determine the category of substance or behavioral addiction that this user may have developed: If above condition is satisfied, by the definition of co-morbidity, then we perform text classification on the user's social media data to obtain information on the most commonly discussed topics. This will aid us in predicting the category of Addiction that the user may have developed. We perform semantic based text classification by using Ontology Based Information Extraction (OBIE) concepts to obtain the addiction categories. This function is defined in our Addiction Category Determination (ACD) algorithm.

CHAPTER – 3

SYSTEM REQUIREMENT SPECIFICATION

3.1 Hardware Requirements

System : Intel i3/i5

Input devices : Keyboard, Mouse

Output device : Monitor

RAM : 1GB

3.2 Software Requirements

Operating System : Windows/Linux

Coding Language : java

Database : MySQL

REFERENCES

[1] Poor sleep quality and suicide attempt among adults with internet addiction: A nationwide community sample of Korea, Kiwon Kim1, Haewoo Lee, Jin Pyo Hong, Maeng Je Cho, Maurizio Fava, David Mischoulon, Dong Jun Kim1, Hong Jin Jeo.

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[4] Predicting Depression via Social Media, Munmun De Choudhury Michael Gamon Scott Counts Eric Horvitz.