A Survey on Mental Health Prediction Using Social Media Network

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Abstract—Social media network is an network that gets utilized a great deal and allows people to connect with others, sharing and accepting data with them, all while utilizing the web to convey. Adults and especially young generation the same utilize social media network on an everyday and once in a while hourly premise. They check social media network commonly every day to see the most recent news, photographs, sharing knowledge, thoughts or opinions within a community of friends. Social media network utilization on a daily basis is influencing emotional wellness in a negative manner that leads towards the mental illness like depression and other mental diseases. The main purpose of this study is to extract and examine the previous work on mental illness via social media network. The basic aim of this paper is survey from the previous work done in detection of mental illness due excess use of social media network to current research work for detection of mental illness via social media network. The significant discoveries from the previous related work of literature for detection of mental illness many of the researchers used different supervised machine learning techniques depends upon the features that will extract from the data which is collected through social media logs of the group of users or individual. The online social networking applications such as Twitter, Facebook, Instagram is a major data sources of online social media with English is the common language that individual or group of users express their emotion, feeling, and also share their views used for mental health detection. In addition, the number researcher found a few challenges like language obstruction, user account privacy, and limited features selection from the big data source of social media network.

Index Terms—Social media network, depression, supervised machine learning, big data

I. INTRODUCTION

Mental health is a worldwide reason for disability. Comprehensively, around 450 million individuals experiencing the emotional well-being issue [1] like depression, tension, schizophrenia, and emotional episode for example bipolar clutters. Then, depression contributes 4.3% of the all out worldwide disease burden. [2] Mental disorder causes any phase of the life, the components that for the most part cause's psychological issue is work pressure, terrible, finical condition, family issues just as characteristic factors. In conventional technique mental health identification depends on up close and personal meeting, self-detailed, and dissemination of surveys which typically tedious procedure and monotonous procedure for discovery of mental issue. In the mean time, with the hazardous development in ubiquity of social media network has become a part of individual's daily lives. Most study on social media network focuses on finding the information behind the information for improving individuals' life. While social media network extend their users capacity in expanding social contacts, due to these they may really diminish the face-to-face interpersonal communication with the real world.

The era of communication technology, in particular fastest growing online social media network give a new life to people to interact and communicated with individual or group of user through social media application like Twitter, Facebook, Instagram to share their views on particular topic or also helpful to write some content and allow user to share their emotions, feelings, sentimental about the topic. This result in the continuous flow of large amount of data containing important information related to sentiments and opinions of people's. As per the survey of Digital 2020: Global Digital Overview, The quantity of individuals around the globe utilizing the internet services has developed to 4.54 billion, an expansion of 7 percent (298 million new clients) contrasted with January 2019. Worldwide, there are 3.80 billion online social media users in January 2020, with this number expanding by in excess of 9 percent (321 million new clients) since this time a year ago. [3] Various researches have been done in the field of online social media networks and find out the relation of mental illness due to excess use of online social media networks. Moreover, leading journals in mental health, such as the American Journal of Psychiatry [4] have reported that the social network mental disorders may incur excessive use, depression, social withdrawal, and a range of other negative repercussions. These kinds of symptoms are indicative criteria for Social Network Mental Disorder Detection. Excessive use of social networking driving towards the psychological issue including anger, tension, depression. Informal organization mental scatters are social-arranged and will in general happen to clients who as a rule connect with others through online web based life.

A recent study shows a strong correlation between suicidal attempts and online social network mental disorder [5], which indicates that teenagers suffering from social network addictions have a much higher risk of suicidal rather than non-addictive users. Social network addiction may negatively impact on emotional status, depression mood. It is needful

to identify the active social network mental disorder user on online social network at an early stage.

In this survey we center just on the recognition of mental condition of online social media user those who are suffer from mental illness like depression. Moreover the mental health detection utilizing data from the social media network were investigated by the few researchers.

II. LITERATURE SURVEY

Online Social media addiction is a type of behavioral addiction with the user addict to the online social media, just like those are addicting to liquor or drugs. Many of the researchers are done studies in the field of online social media addiction that leads towards mental disorders like depression. Many of the methods and techniques are applied to predict the mental state of the user those who are addicted to the online social media through social media data of that individual or a group of users. On the other hand, ongoing research in Psychology and Sociology reports various mental elements identified with social network mental disorders. Research shows that due to dependence with online social media network depression among youngsters increasing day by day with negative tendencies that further leads towards suicidal attempts.

Elvis Saravia et al. [6] Author mentioned in his paper that people that is suffering from mental disorders usually wants to avoid the other people company and happy to stay with own thoughts and because of that they use a social media network to express their feelings and emotions. The author proposed a system name Mental Illness Detection and Analysis via Social Media MIDAS. Use the twitter is a major data source to collect data of the user those who are isolated from community and use online social media platform to express their emotions through tweets that will help to predict the mental state of user. During the data collection process use keyword matching approaches to collect the data of the users and broadly classified into classes of user i.e. Patients and Non-Patients. The author uses the TF-IDF Features for linguist features of patients and Pattern of Life Features (PLF) reveal the emotional patterns and behavioral with combination of polarity feature to identify the ration of positive or negative tweets or neutral tweets. They design an online framework that separates the highlights features of a user by considering two mental issues and random forest classifier is used to predict foresee the psychological condition of the user and their framework gives the insignificant outcomes that can be utilized in future to anticipate the user conduct all the more effectively.

Keumhee Kang et al. [7] Author proposed the system of multimodal analysis by using twitter data to identify the depressive users by analyzing their social activities like daily tweets on twitter for long period of time. In this paper author uses the crawling techniques to gather information from twitter and spares it into their database utilizing open API. Crawling is done using catchphrases and real time data. The tweets can be filtered by using some queries and thereafter filtering tweets are split into segmented sentences broadly divided

into text, emoticons, and images. Support Vector Machine (SVM) based classifier is utilized to gain proficiency with the relationship among words identified with human state of mind and structure of sentences. They build a mood lexicon for text and emoticons analyses by using Visual Sentiment Ontology and Senti strength dictionaries. The outcomes show that a multimodal that is created has high precision when contrasted with the current techniques, and can proficiently anticipate the users mood.

Maryam Mohammed Aldarwish and Hafiz Farooq Ahmed [8] They put in the picture that the far reaching utilization social media could give chances to help detect the depression which is undiscovered. From the activities of the user in social media we get the exercises and lead of mentally depressed user and the point of view. In these study author developed a web application that will assist with ordering the internet based life user into four distinct levels (Minimal, Mild, Moderate, Server). Author uses the Facebook and Twitter as data source to collect data and use BD-II questioners and analyze the collected data from several text analyses API. From that analyzed data which is collected, focused on the word that are used in the users comments and tweets that shown the negative impact of user mood. After analyzing collected data the author build a depression model using RapidMiner and test SVM and Naive Bayes classifiers and their system has the simplest precision and minimal accuracy and recall.

Munmun De Choudhury et al. [9] Author tells in his paper the capability of utilizing social media as a reliable tool for estimating population scale depression patterns. Social media is solid apparatus for estimating depression. In this paper author utilizes crowd sourcing techniques to extricate information from twitter and fabricate a SVM classifier to predict the accuracy of depression. Plays out a learning based investigation by considering structures and structures of sentences including words identified with the human states of mind, and uses Support Vector Machine (SVM) to comprehend the relationship among them.

Bridianne O'Dea et al. [10] Author aimed to find mental state of user including depression and sociality due to increasing in the use of online social media like twitter. In the study author aimed to recognize level of worry among depression and suicide related tweets, using both human coders and a machine classifier.

Thin Nguyen et al. [11] In this paper, author studied about the integral part of online depression communities and compared with other communities. Machine learning and factual techniques were used to separate online messages between depression and control communities. Author proposed that information mining of online web journals can possibly identify significant information for depression studies. Machine learning algorithms features the potential for online depression communities.

Huijie Lin et al. [12] In this paper, author state that users stress state is firmly identified with that of his/her companions in social media network, and we utilize an enormous scope

dataset from certifiable social stages to efficiently contemplate the relationship of user' pressure states and social connections. Author initially characterize a set of pressure related printed, visual, and social traits from different viewpoints, and afterward propose a novel half breed model - a factor chart model joined with Convolutional Neural Network to use tweet substance and social cooperation data for stress detection.

III. CONCLUSION

The Lifestyle of individuals these days drives depression even in youthful age. As the study demonstrates that the downturn rate is expanding day by day. Mental health detection using online social network that is broadly concentrated in the ongoing years. Many procedures in the literature survey indicating the chance of mental health detection discovery utilizing on the online social network are practical and achievable to be recognized rapidly utilizing increasingly broad strategies. The greater part of the work accessible in the literature significantly uses twitter as online internet based life stage for information collection. It is seen that the usuage example of Social Media user including their season of usuage, their posts, and other social exercises mirrors the disposition of the user which can be exceptionally useful to break down the Mental State of the user and predicting depression.

REFERENCES

[1] Global Burden of Disease Study 2013 Collaborators. (2015, June 7). Lancet, 386(9995), 743–800. Doi: 10.1016/S0140-6736(15)60692-4.

[2] R. Abd Rahman, K. Omar, S. Mohd Noah and M. Mohd Danuri, "A Survey on Mental Health Detection in Online Social Network", International Journal on Advanced Science, Engineering and Information Technology, vol. 8, no. 4-2, p. 1431, 2018. Available: 10.18517/ijaseit.8.4-2.6830.

[3] Block J., "Issues for DSM-V: Internet Addiction", American Journal of Psychiatry, vol. 165, no. 3, pp. 306-307, 2008. Available: 10.1176/appi.ajp.2007.07101556.

[4] Digital 2020: Global Digital Overview — DataReportal – Global Digital Insights", DataReportal – Global Digital Insights, 2020. [Online]. Available: https://datareportal.com/reports/digital-2020-global-digital-overview.

[5] Lin et al., "The association between suicidality and Internet addiction and activities in Taiwanese adolescents", Comprehensive Psychiatry, vol. 55, no. 3, pp. 504-510, 2014. Doi: 10.1016/j.comppsych.2013.11.012.

[6] E. Saravia, C. Chang, R. Lorenzo, and Y. Chen*, "MIDAS: Mental Illness Detection and Analysis via Social Media", in 2016 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM), San Francisco, CA, USA, 2016, pp. 1418 -1421.

[7] K. Kang, C. Yoon and E. Kim, "Identifying depressive users in Twitter using multimodal analysis", in 2016 International Conference on Big Data and Smart Computing (BigComp), Hong Kong, China, 2016, pp. 231-238. Doi: 10.1109/BIGCOMP.2016.7425918

[8] Maryam Moh. Aldarwish and Ahmad Hafiz Farooq, "Predicting Depression Levels Using Social Media Posts", in 2017 IEEE 13th International Symposium on Autonomous Decentralized System (ISADS), Bangkok, Thailand, 2017, pp. 277-280, Doi: 10.1109/ISADS.2017.41.

[9] M. Choudhury, S. Counts et al, "Social media as a measurement tool of depression in populations", in WebSci '13: Proceedings of the 5th Annual ACM Web Science Conference, 2013, pp. 47-56. Doi: 10.1145/2464464.2464480.

[10] B. O'Dea, S. Wan, P. Batterham, A. Calear, C. Paris and Christensen H., "Detecting suicidality on Twitter", Internet Interventions, vol. 2, no. 2, pp. 183-188, 2015. Available: 10.1016/j.invent.2015.03.005.

[11] T. Nguyen, D. Phung, B. Dao, S. Venkatesh et.al, "Affective and Content Analysis of Online Depression Communities," in IEEE Transactions on Affective Computing, vol. 5, no. 3, pp. 217-226, 1 July-Sept. 2014, Doi: 10.1109/TAFFC.2014.2315623.

[12] Jia et al., (2017) "Detecting Stress Based on Social Interactions in Social Networks," IEEE Transactions on Knowledge and Data Engineering, 29(9) pp. 1820-33, (1 Sept. 2017), Doi: 10.1109/TKDE.2017.2686382.