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A Review on Deep Learning Framework for Automated Depression Detection via Social Media

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ABSTRACT: One of the most prevalent and disabling mental conditions that seriously influence society is stress and depression. The use of social networking to improve the detection of stress and depression may require automatic health monitoring systems. Sentiment analysis refers to the use of content mining and natural language processing techniques with the goal of identifying feelings or opinions. full of emotion Computing is the study and development of systems and equipment that can recognise, understand, process, and imitate human effects. Deep learning and sentiment analysis approaches could provide effective algorithms and frameworks for a target evaluation and observation of mental issues, particularly depression and stress. This research discusses the use of sentiment analysis and deep learning approaches for the detection and monitoring of stress and depression. Additionally, a fundamental foundation for a multimodal framework that integrates estimating investigation and extensive methods for processing feelings is given. This framework will be used to assess for stress and sadness. The paper specifically traces the fundamental problems and compares them to the framework's structure.

KEYWORDS: stress and depression; ehealth; sentiment analysis, social media, deep learning.

I. INTRODUCTION

The richest source of human-generated text input is likely social media. Internet users' opinions, comments, and criticisms reveal their attitudes and feelings about particular subjects. This paper introduces a knowledge-based system that monitors users' emotional health in order to identify users who may be experiencing psychological problems, including sadness and stress. In most cases, these psychiatric disorders' symptoms are passively observed. The author contends that in this case, extracting online social behaviour provides a chance to actively recognise psychological disease at an early stage. Because the psychological aspects covered in the typical diagnostic criteria questionnaire cannot be seen by the registers of online social activities, diagnosing the disease might be challenging.

One of the most prevalent and incapacitating mental disorders, depression and stress also has a significant social influence. Currently, strategies for stress and depression identification and diagnosis rely on self-reporting along with the knowledgeable judgement of healthcare professionals. To enhance the performance of healthcare professionals and reduce healthcare expenses, it may be essential to provide efficient health monitoring systems and diagnostic tools. Sentiment and deep learning technologies may be able to aid with these goals by offering efficient tools and systems for impartial evaluation. These programmes and tools could assist the decisions made by psychologists and psychiatrists rather than trying to replace them.

Our new and cutting-edge method for identifying psychological disorders does not rely on respondents' self-reports of those psychological characteristics on surveys. Instead, suggest a machine learning technique for the detection of psychological disorders in social networks that makes use of the features gathered from the data of social networks to precisely identify potential disorders. We analyse the attributes of the two categories of psychiatric diseases, use machine learning to huge data sets, and perform a characteristic analysis.

II. RELATED WORK

Online social networks (OSN) provide relevant information on users' opinion about different themes. Thus, applications, such as monitoring and recommendation systems (RS) can collect and analyze this data. This paper presents a Knowledge-Based Recommendation System (KBRS), which includes an emotional health monitoring system to detect users with potential psychological disturbances, specifically, depression and stress[1].

Sentiment analysis on microblog posts has been studied in depth, sentiment analysis of posts is still challenging because of the limited contextual information that they normally contain. In microblog environments, emoticons are frequently used and they have clear emotional meanings. They are important emotional signals for microblog sentimental analysis. They address this issue by constructing an emotional space as a feature representation matrix and projecting emoticons and words into the emotional space based on the semantic composition[2].

In this paper, author propose an integrated social media content analysis platform that leverages three levels of features, i.e., user-generated content, social graph connections, and user profile activities, to analyze and detect anomalous behaviors that deviate significantly from the norm in large-scale social networks. Several types of analyses have been conducted for a better understanding of the different user behaviors in the detection of highly adaptive malicious users[3].

In this paper, we find that users stress state is closely related to that of his/her friends in social media, and we employ a large-scale dataset from real-world social platforms to systematically study the correlation of users' stress states and social interactions. We first define a set of stress-related textual, visual, and social attributes from various aspects, and then propose a novel hybrid model - a factor graph model combined with Convolutional Neural Network to leverage tweet content and social interaction information for stress detection[4].

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[5].

In this paper, 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[6].

In our paper, propose an alternative approach providing evidence that daily stress can be reliably recognized based on behavioral metrics, derived from the user's mobile phone activity and from additional indicators, such as the weather conditions (data pertaining to transitory properties of the environment) and the personality traits (data concerning permanent dispositions of individuals). Our multifactorial statistical model, which is person-independent, obtains the accuracy score of 72.28% for a 2-class daily stress recognition problem. The model is efficient to implement for most of multimedia applications due to highly reduced low dimensional feature space (32d). Moreover, we identify and discuss the indicators which have strong predictive power[7].

In this paper, study the evolution of activity between users in the Facebook social network to capture this notion. Also find that links in the activity network tend to come and go rapidly over time, and the strength of ties exhibits a general decreasing trend of activity as the social network link ages. For example, only 30% of Facebook user pairs interact consistently from one month to the next. Interestingly, and find that even though the links of the activity network change rapidly over time, many graph-theoretic properties of the activity network remain unchanged[8].

Social media tools are wide spread in web communication and are gaining popularity in the communication process between public institutions and citizens. This study conducts an analysis on how social media is used by Official Statistical Institutes to interact with citizens and disseminate information. A linear regression technique is performed to examine which social media platforms (Twitter or Facebook) is a more effective tool in the communication process in the official statistics area. Our study suggests that Twitter is a more powerful tool than Facebook in enhancing the

relationship between official statistics and citizens, complying with several other studies. Next, performed an analysis on Twitter network characteristics discussing “official statistics” using NodeXL that revealed the unexploited potential of this network by official statistical agencies[9].

The paper presents further research on neural engineering that focuses on the classification of emotional, mental, physical and no stress through the use of Electroencephalography (EEG) signal analysis. Stress is one of the leading causes of several health-related problems and diseases. Therefore, it becomes necessary for people to monitor their stress. The human body acquires and responds to stress in different ways resulting to two classifications of stress namely, mental and emotional stress. Traditional methods in classifying stress such as through questionnaires and self-assessment tests are said to be subjective since they rely on personal judgment. Thus, in this study, stress is classified through an objective measure which is EEG signal analysis. The features of the EEG recordings are then pre-processed, extracted, and selected using Discrete Wavelet Transform (DWT). These features are then used as inputs to classify stress using Artificial Neural Network (ANN) and validated using K-fold Cross Validation Method. Lastly, the results from the software assisted method is compared to the results of the traditional method[10].

III. EXISTING SYSTEM/OPEN ISSUES

In the proposed systemic approach, we formulate the task as a classification problem to

Negative comments

An innovative solution to monitor and detect potential users with emotional disorders, according to the classification of sentences with depressed or stressed content.

IV. CONCLUSION

The suggested method puts people's health at risk by automatically detecting potential online users who are depressed and stressed. Thus, people who are depressed can be discovered and assisted before they take any severe actions that could have an adverse long-term effect. We investigate the relationship between user states of psychiatric condition and their social interaction behaviour using data from real-world social networks, and we advise users to send mail-based health precautions when engaging in user interaction.

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