

Stress Based Detection on Social Interactions in Social Networks

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Abstract: Psychological stress is ominous person's health. It is non-trivial to detect stress timely for proactive care. With the attractive of social media, person are used to sharing their daily task and communicating with friends on social media platforms, making it feasible to leverage online social network data for stress detection. In this paper, we find that users stress condition 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 examine the connection of users' stress condition's and social interactions. We first define a set of stress-related textual analysis, 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. Experimental results show that the proposed model can better the detection performance by 6-9% in F1-score. By further analysing the social interaction data, we also discover several intriguing phenomena, i.e. the number of social structures of sparse connections (i.e. with no delta connections) of stressed users is around 14% more than that of non- stressed users, indicating that the social structure of stressed users' friends tend to be less connected and less complicated than that of non-stressed us.

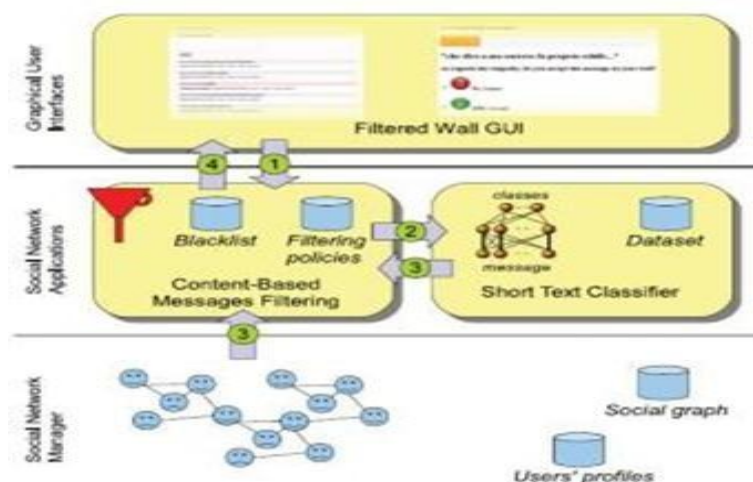
Keywords : Stress detection, factor graph model, micro-blog, social media, healthcare, social interaction

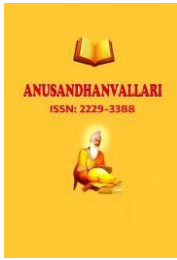
I. Introduction

The digital era that makes the relationship is being impacted by the digital revolution. Modern technology diverts time and attention from spouse, families and friends [1]. Due to rise in interaction of people in social media platforms, making it feasible to identify online social network data for stress detection. The paper implements various stress detection methods to find the user's psychological stress state, and able to identify the higher efficiency stress detection method. Many studies on social media based emotion analysis are at the tweet level, using text-based linguistic features and classic classification approaches. A system that make emotion analysis on the Chinese micro-blog platform called Weibo using Mood Lens [2]for classifying the emotion categories into four types, i.e., angry, disgusting, joyful, and sad. An existing system studied the emotion propagation problem in social networks, and found that anger has a stronger correlation among different users than joy, indicating that negative emotions could spread more quickly and broadly in the network. As stress is mostly considered as a negative emotion, this conclusion can help us in combining the social influence of users for stress detection. Traditional psychological stress detection in student environment is mainly based on behavior of student in the class. Those students may be inattentive, lack of confidence, alone and low self-esteem etc. However, finding those stressed students can possible by continuous monitoring of the faculty which is laborious task in mass student group and unpredictable. We first define a set of stress-related textual, visual, and social attributes from various aspects, a Convolution neural network used for feature extraction and test data label classification is done using Support Vector Machine (SVM), Random Forest (RF) and Probabilistic Neural Network (PNN) respectively that leverage a tweet content and social interaction information for stress detection.

II. Related Work

Psychological stress detection is related to the topics of sentiment analysis and emotion detection. Research on tweet-level emotion detection in social networks. Computer-aided detection, analysis, and application of emotion, especially in social networks, have drawn much attention in recent years [8], [9]. Relationships between psychological stress and personality traits can be an interesting issue to consider. For example, [1] providing evidence that daily stress can be reliably recognized based on behavioral metrics from users' mobile phone activity. Many studies on social media-based emotion analysis are at the tweet level, using text-based linguistic features and classic classification approaches. [53] Proposed a system called MoodLens to perform emotion analysis on the Chinese microblog platform Weibo, classifying the emotion categories into four types, i.e., angry, disgusting, joyful, and sad. [9] Studied the emotion propagation problem in social networks, and found that anger has a stronger correlation among different users than joy, indicating that negative emotions could spread more quickly and broadly in the network. As stress is mostly considered as a negative emotion, this conclusion can help us in combining the social influence of users for stress detection. However, these works mainly leverage the textual contents in social networks. In reality, data in social networks are usually composed of sequential and inter-connected items from diverse sources and modalities, making it are cross-media data. Research on user-level emotion detection in social networks. While tweet-level emotion detection reflects the instant emotion expressed in a single tweet, people's emotional or psychological stress states are usually more enduring, changing over different periods. In recent years, extensive research starts to focus on user-level emotion detection in social networks. Our recent work [29] proposed to detect users' psychological stress states from social media by learning user-level presentation via a deep convolution network on sequential tweet series in a certain period. Motivated by the principle of homophily, incorporated social relationships to improve user-level sentiment analysis on Twitter. Though some user-level emotion detection studies have been done, the role that social relationships play in one's psychological stress states, and how we can incorporate such information into stress detection have not been examined yet. Research on leveraging social interactions for social media analysis. Social interaction is one of the most important features of social media platforms. Now many researchers are focusing on leveraging social interaction information to help improve the effectiveness of social media analysis. [12] Analyzed the relationships between social interactions and users' thinking and behaviors, and found out that Twitter-based interaction can trigger effectual cognitions. Leveraged comments on Flickr to help predict emotions expressed by images posted on Flickr. However, these work mainly focused on the content of social interactions, e.g., textual comment content, while ignoring the inherent structural information like how users are connected.





III. Proposed System

We extend the proposed algorithm which analysis the student's learning experiences by giving solutions to their problems. The suggested solution is forwarded to the student's individual email-ids to attain the privacy of student and for improving security a novel secure algorithm called BIRCH is proposed. Finally we get the feedback from the students about solution provided and comparison graph is generated

Advantages

- It is local in that each clustering decision is made without scanning all data points and currently existing clusters.
- It exploits the observation that data space is not usually uniformly occupied and not every data point is equally important.
- It makes full use of available memory to derive the finest possible sub-clusters while minimizing I/O costs.
- It is also an incremental method that does not require the whole data set in advance.

System Architecture

IV. Conclusion

In today's world, where mainly the youth and almost all of the population is suffering from surmounting stress, be it because of peer pressure, work load or other domestic tensions; it is very crucial to have a reality check about how stressed a person really is.

It is because of this reason that timely detection and prevention of stress is a dire need. We have come up with this project which assists people in scrutinizing the problem of stress.

This project will be very beneficial for those who are not so comfortable in opening up about their problems to others. It will help these people get a reality check and may prompt them to reach out and get medical help, just based on their social interactions

We have utilized both human as well as machine learning and applied the concepts of Sentiment Analysis. The main characteristic of this system is its non-invasiveness and fast-oriented implementation in detecting stress when compared with the previous approaches.

V. References

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