

Detecting Stress Based on Social Interactions in Social Network

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Abstract—Psychological stress is threatening people's health. It is non-trivial to detect stress timely for proactive care. With the popularity of social media, people are used to sharing their daily activities and interacting with friends on social media platforms, making it feasible to leverage online social network data for stress detection. In this project, 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-factor graph model combined with Convolution Neural Network to leverage tweet content and social interaction information for stress detection. Experimental results show that the proposed model can improve the detection performance by 6-9% in F1-score. By further analyzing 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% higher 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 users.

Keywords—Stress, Psychology, Correlation, Medical services, Twitter, Neural networks.

1 INTRODUCTION

Psychological stress is becoming a threat to people's health nowadays. With the rapid pace of life, more and more people are feeling stressed. According to a worldwide survey reported by new business in 2010, over half of the population has experienced an appreciable rise in stress over the last two years. Though stress itself is non-clinical and common in our life, excessive and chronic stress can be rather harmful to people's physical and mental health. According to existing research works, long-term stress has been found to be related to many diseases, e.g., clinical depressions, insomnia etc. Moreover, according to Chinese center for disease control and prevention, suicide has become the top cause of death among Chinese youth, and excessive stress is considered to be a major factor of suicide. All these reveal that the rapid increase of stress has become a great challenge to human health and life quality.

1.1 Existing System

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. Relationships between psychological stress and personality traits can be an interesting issue to consider. For example, providing evidence that daily stress can be reliably recognized based on behavioral metrics from users mobile phone activity.

1.2 Disadvantages

- More time consuming.

1.3 Proposed System

We proposed a hybrid model which combines the factor graph model (FGM) with a convolution neural network (CNN). In this work, we also discovered several intriguing phenomena of stress. We found that the number of social structures of sparse connection (i.e. with no delta connections) of stressed users is around 14% higher 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 users. These phenomena could be useful references for future related studies.

1.4 Advantages

- Less time consuming.

1.5 Modules

- Data collection
- CNN+ FGN
- Tweet Classification
- Attribute Categorization

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1.6 Data Collection

To lead perceptions and assess our successive model, we initially gather a set of datasets utilizing diverse naming techniques

2 CNN+ FGN

We propose a bound together hybrid model incorporating CNN with FGM to use both tweet content properties and social connections to upgrade stress discovery.

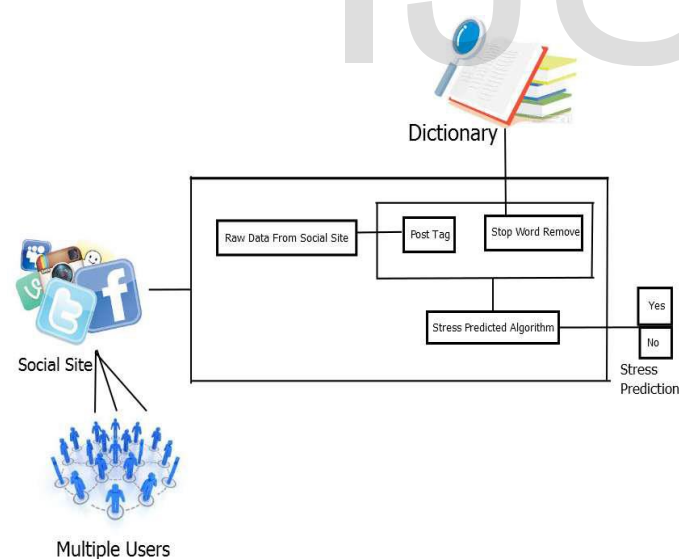
2.1 Tweet Classification

We utilize a cross auto-encoder (CAE) to take in the methodology invariant representation of each single tweet with various modalities. Indicating the content, visual, and social traits of a tweet by VT, VI, and vs., the CAE is planned.

2.2 Attribute Categorization

To address the issue of stress recognition, we initially characterize two arrangements of ascribes to quantify the distinctions of the stressed and non-stressed on user via web-based networking media stages.

3 ARCHITECTURE



4 CONCLUSION

In this system, we displayed a system for distinguishing users,, psychological stretch states from clients' week after week online networking information, utilizing tweets' substance and additionally clients' social associations. Utilizing true online networking information as the premise, we contemplated the connection between client mental anxiety states and their social communication practices. To completely use both substance and social communication data of clients' tweets, we proposed a half and half model which joins the factor diagram display (FGM) with a convolution neural system (CNN).

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