

User Stress Level Detection From Social Networks Based On Social Interactions

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Abstract

Psychological stress is the one of the main factors of the people's health, it effect on working environment. Twitter is one of the best social media for sharing their regular feelings like emotions, angry, happy, daily activities, work status with their friends, employees and others. This platform needful to social media data for express the stress in social network. In this proposed method, detects the users stress state of social media users. The related data set developed by a hybrid model graph technique combined with dimensional reduction and Neural Network (CNN) based on user tweet content and social interaction. To find results by their friends in social media database by systematically study the user's social interactions and correlation between user's stress states. This method has given sophisticated results for improves the identification performance level by 8-15% in F1-score.

Keywords: *psychological stress, social network, factor graph model, neural network, F1-score, social interaction*

1 Introduction:

Nowadays social media is very helpful for communicate with other persons and sharing their feelings within locally or globally. In their regular habits, they share information very freely and send that information with regular keywords. If the administrator can analyze the all the user information with the help of predefined keywords, he can identify the stress level of the all users and employees. So admin easily identified his stress level for assigning the further related work. Twitter is one of the best social media flat form, more number of people are using predefined text keywords to share information to others. Using, these flat forms identified the stressed and non stressed twitter users^{5,6}.

Data mining is one of the analytical tools, it analyzes and studying of the data from different sources or perspectives and summarize the useful data in many real time applications to finding similarities among various of fields in large relational databases for to analyze the data from many different dimensions, categorize and summarize the relationships identified.

The data mining establish the link between analytical systems and separate transaction in large scale information, which is based on open ended user quires and system analytical model, neural networks and machine learning models. Generally data mining work with clusters, classes, association and sequential pattern relationships.

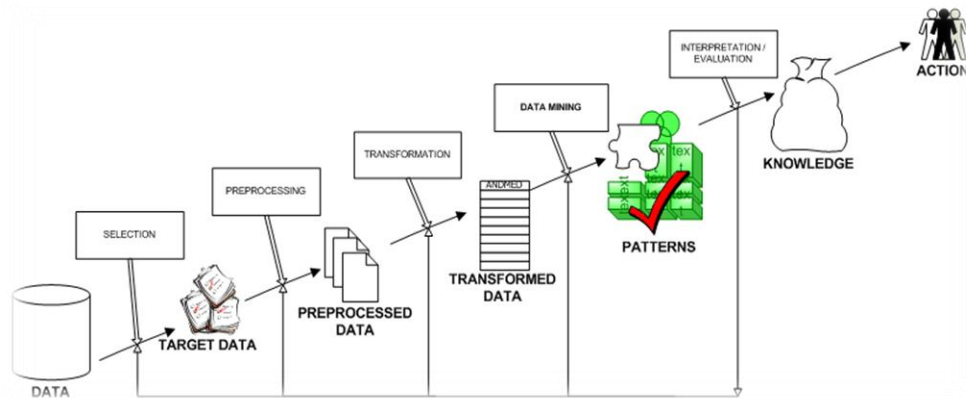


Fig. 1.1: Structure of Data Mining

Fig.1.1 represents the basic block diagram for data mining structure. It gives the information about data, how the data is utilized and how it is useful for identification of target levels in this proposed work.

2 Literature Survey

Many researches are proven the reason, the stress of human reduces their quality of life and causes many diseases. They devices the user stress by physiological parameters (obtrusive sensors). Andrey Bogomolo suggested a new method by behavioral metrics likes personality traits and user's mobile phone activity which is person-independent.. This multifactorial statistical model gives more accuracy score than the physiological parameter r 2-class daily stresses recognition problem. Its very applicable to multimedia applications for reducing low dimensional feature space (32d). It overcomes the limitation of the current evaluation method¹, Chris Buckley and Ellen M Voorhees proposed a method for retrieval evaluation with incomplete Information. It is both highly correlated with existing measures when complete judgments are available and more robust to incomplete judgment sets².

Xiaojun Chang, Yi Yang implemented highly scalable algorithm for improving the efficiency than existing alternatives. This experiment on recent TRECVID data sets verify the superiority of the proposed approach. In this method focused on detecting complex events in unconstrained Internet videos. Achieved this limitation of the abundance of labeled training data due to more difficult zero-setting where no training data are supplied³.

Glen Coppersmith and Craig Harman suggested post traumatic stress disorder in social media twitter. The post traumatic stress disorder (PTSD) problems are obtained from social media data by studying depression. Because its limited evaluation of other mental health conditions. Overcome these problems by using a novel method to obtain a PTSD classifier by simple searches in social media twitter with a significant reduction in the training data. The building classifiers are separate the PTSD and random individual building classifiers⁴.

3 Input and Output Design

The administrator develop the input design for develop the link between social media user and information system for comprises the developing procedure and specification for data preparation. This procedure is mandatory for putting the transaction data into a useful manner. It verified by the computer to read data from a hard copy or by collecting the data directly to the system. The input system is focused to controlling for errors, avoiding delays and improves the speed of the process, and then it provides

user's security and simple retaining. The mail role of this design process identified the data type, data coding method, errors identify and preparing input validations.

The efficient and intelligent output designs are needed at the output end for improving the system relating to help user decision-making. The output design implemented for meeting the requirements of end users with clear information. The information was to displaced effectively, quickly by the hard copy at the output. The people used the system easily and effectively and they should identify the specific information efficiently inform of report, document or other format.

4 Proposed method

The main objective of the study is developing the input design system for converting user-oriented description into a computer-based system. The design is applicable for avoiding errors, delay with correct detection to get the exact information from the computerized system. This information is achieved by creating user-friendly screens for data entry to handle large volume of data. The informative data make easier and error free. The can be very informative inform of screens. The appropriate messages are provided as when needed so that the user will not be in maize of instant^{7,10,11}.

Hardware & Software requirements:

- Operating system : Windows 10
- Coding Language : python
- Tool : pychram
- Database : MYSQL
- Server : Flask
- Hardware : Good configurable PC

5 Existing System

In previous case MoodLens emotion analysis is used in the social media like text-based classic classification and linguistic features approaches. These emotion categories as emotion based like happiness, angry, disgusting and sad. The existing algorithm quickly studied and identified the negative emotions among different users than joy through social media networks. The stress detection is one of the factors in negative emotion, it has not given sophisticated results in case of traditional psychological stress because of it is based on self-report questionnaires and face-to-face report^{8,9}. The standard implements are difficult due to hysteretic, human power and time costing. These works mainly focused on textual contents¹⁵. Generally in inter/intra organization text conversation composed of interconnected of social media and related data get from diverse sources, making with cross-media data. For getting accurate data for detection of stress, examine the user stress levels, but it is not possible to maintain the social relationships for obtaining the every one's psychological stress state^{12,13}.

Overcome the problem by using the proposed model for improving the exploiting the user's social interaction attributes to enrich the result of the detection performance by social interaction and analyze the correlation of user's stress states in current using social networks. It gives better performance than the traditional methods. In the proposed method, the social interaction content identify the status of the working users, which is based on the stress / non stress in social media flat form. For obtaining effective results evaluate the different data based information is collected from several twitter posting data based

and popular social media platforms. Then carry out in-depth studies on predefined word data set and compare the correlations between stress status and social interaction.

6 Results and Discussions:

In this present work, the user's stress level can be identified by with the help of social media twitter. The administrator can analyze the total percent of information about stress and non-stressed users, which is based on the user's followers, following, twitting and re-tweeting data information system. Initially the administrator maintains the users account information and studied about how to use the predefined keywords from the database, which are related to human feelings and emotions. These users emotional data can be categorized into stressed and non-stressed keywords, which are collected from other frequently used social media data. These data information is collected and stored in present social media (twitter). The administrator study the human behavior periodically by his tweets, retweets, following or followers data.

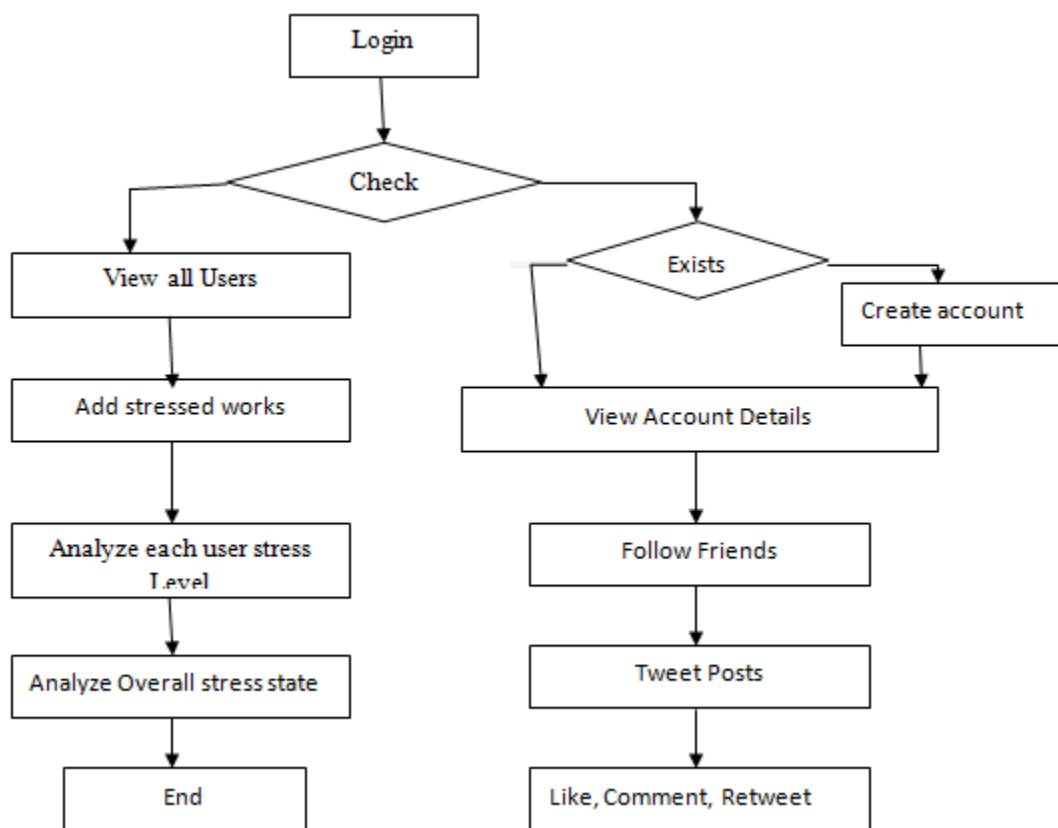


Fig 6.1 . Flow chart for system design

When users create an account from social media (twitter), he regularly used the same account for sharing his emotional feelings to others by text or emojis. At this time he will use predefined stressed and non-stressed text information from the current database. Similarly a number of users are joined and used that flat form for sharing their personal or official information to others in the form of text. Based on the text the administrator analyzes the stress and non stressed level of all the users in that currently using social media (twitter).



Fig. 6.2: Example of tweeting messages through twitter

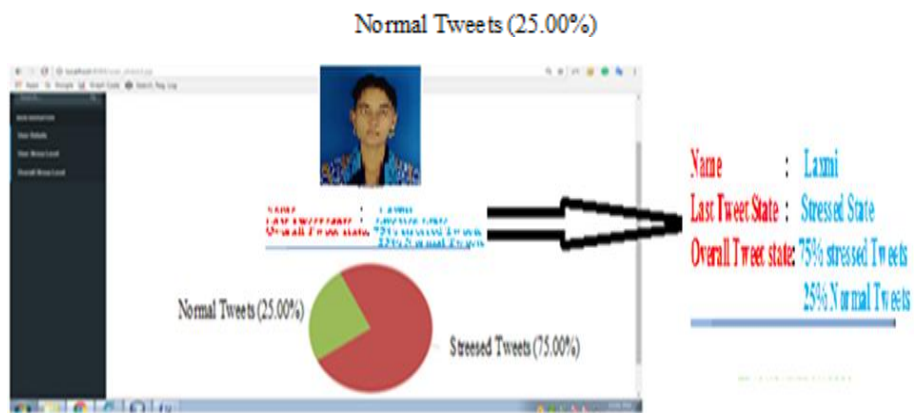


Fig. 6.3: Status of measure stress levels of user

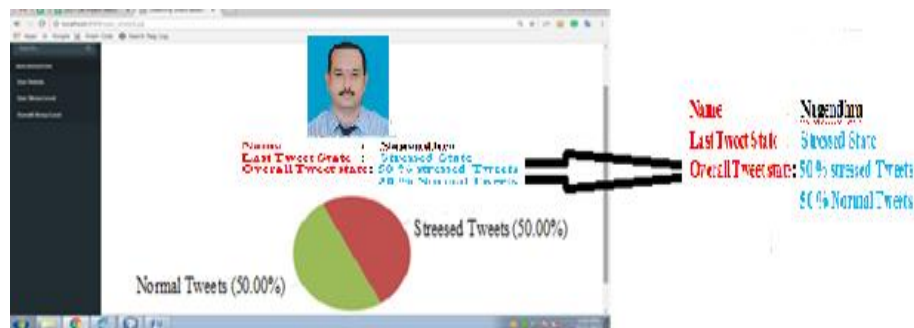


Fig. 6.3: Status of measure stress levels of user-2

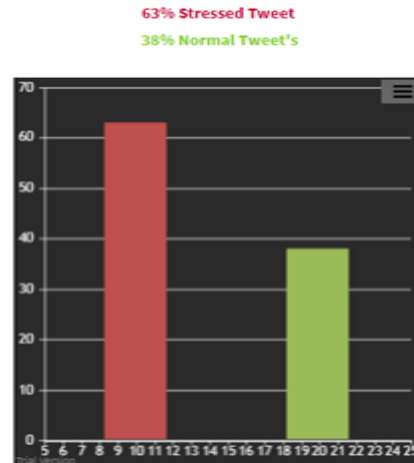


Fig. 6.5: Overall performance of user stress report

Fig 6.2 represents the example of a user tweet/ re-tweet of user from twitter. The text in the box represents the predefined keyword information. Figure 6.3 and figure 6.4 representing the calculation of the stress level of the users. Fig 6.5 represents the overall statistics about all user stress information, the administrator finds the 63% in stress level and 38% in normal level users in local twitter social media group.

7 Conclusions

In this paper, implemented algorithm for identifying and detecting the psychological user's stress from weekly social media (twitter) data, social interactions and leverage tweet's content. The employees/user psychological stress status and interaction in the organization are identified by user's social interaction in social media and predefined content of the user's tweet and predefined data base text content. For analysis this study implemented a advanced method by combination of the factor graphs model (FGM) with a convolution neural network (CNN). The discovered several employees or users intriguing phenomena of stress. In that social media flat form, the number of stress users is approximately 14% higher than the non stressed users. This method is very applicable in many organizations for detecting their stress levels, which is very helpful to study their effects on their works.

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