

SURVEY on Detecting Stress based on Social Interaction in Social Networks

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Abstract—Stress in terms of psychology is menacing people groups psychological well-being. It is important to opportunely distinguish this pressure for lively consideration. With the expanding fame of online media stages , every person is acclimatized to sharing their every day exercises and having an association with people who are close to them via web-based media stages such as twitter, making it sensible to grasp or think about the information from interpersonal organizations for distinguishing pressure. We essentially track down that a client's pressure levels are adamantly acclimatized with that of their companions in web-based media stages such as twitter, and afterward we utilize a broad dataset from genuine social stages to completely consider the association of clients' stress states and social communications. We start, disclosing a set identified with pressure literary, visual, and social ascribes from different boundaries, and afterward propose a plot results from the examinations which show that the model we proposed can improve the location execution. With the assistance of launch, the site is built for the end-user to recognize their level of rate of stress and be able to verify other activities associated with it.

I. INTRODUCTION

Stress in terms of psychology is becoming harmful to people's mental health in recent times. With the fast forward pace of lifestyle, too many individuals are focused. As indicated by a study announced by Newbusiness in 2010, the greater part of the populace have encountered a conspicuous ascent in feelings of anxiety during the last few years[1]. Despite the fact that pressure is a common and non-clinical occurrence in our daily lives, inordinate and ongoing pressure can rather pose a danger to individuals' well being truly and intellectually. As hinted by all the previous exploration works, stress which is long haul has been discovered to be prompting a lot more sicknesses, for example: insomnia, clinical sorrow, and so on As indicated by a review additionally, the top reason for death among Chinese youth has become self destruction, and an excess of stress is viewed as a critical component of suicide. All of

these disclose that the quick expansion in pressure has become a greater test to human wellbeing and life record. Along these lines, there is conspicuous significance for stress identification before it transforms into destructive infections. Regular mental pressure location is altogether solid on coordinated meetings, self-report polls for wearable sensors. Be that as it may, ordinary ways are really responsive, which are ordinarily work devouring, hysteric, and time-costing[5]. The ascending web-based media stages and it's uses are altering life of individuals, just as medical care and wellbeing research. With the developing informal communities like Twitter, the more individuals will share about their day by day occasions and dispositions, and have communication with their companions by means of interpersonal organizations. As these information from web-based media mirror clients' genuine states time to time and furthermore the feelings methodically, it allows new opportunities for portrayal, estimation, mining, and displaying, clients' examples of conduct through the greater, coordinated interpersonal organizations, thus, such friendly data can track down its theoretical terms in psychological research[3].

II. LITERATURE SURVEY

A. CNN and FGM

Huijie Lin. et al. [1] aim to test a bunch of pressure related literary, visual, and social credits from different perspectives, and afterward propose a novel half and half model—a factor diagram model joined with Convolutional Neural Network to use tweet substance and social association data for stress discovery. Exploratory outcomes show that the proposed model can improve the location execution by 6-9% in F1-score. By further dissecting the social communication information, we additionally find a few fascinating wonders.

They say impediments exist even in tweeting content based pressure recognition frameworks. Right off the bat they say

that tweets were restricted to a limit of 140 characters on friendly stages like twitter and clients didn't in every case express their distressing states straightforwardly in tweets. Also, clients with high mental pressure may display low liveliness in informal communities. Henceforth these wonders caused the innate information sparsity and uncertainty issue, which may have harmed the exhibition of tweeting content based pressure discovery.

The creators of this paper are definitely motivated by the mental speculations which is the reason they chose to characterize a bunch of properties for stress discovery from tweet level and client level angles separately.

- Tweet level attributes : these were from a single tweet from the user[1].
- User level attributes :These are from a client's week-to-week tweets.The Tweet-level ascribes the majority of semantic, visual, and social consideration (i.e., being loved, retweeted, or noted) credits derived from the content, picture, and consideration list of a single tweets.In any case, the User-level credits include: (a)posting conduct ascribes as closed from a client's weekly twitter postings and (b)Separated from a client's social relationships with companions, social cooperation ascribes. The social collaboration credits, in particular, can be fine-tuned into: (i)The substance of clients' social cooperations with companions is used to create social association material; and (ii)Credits for the social communication structure came from the client's design of social ties with friends or relatives[1].

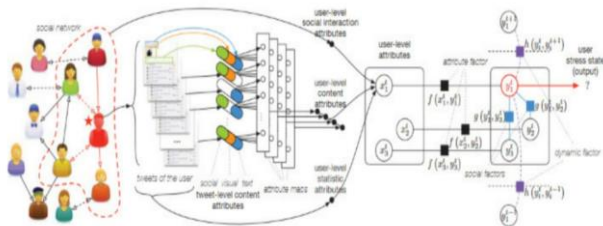


Fig. 1 Methodological diagram

First, they plan a CAE with CNN to deliver client state communication data at-recognitions from tweet-level ascribes. CNN has been discovered to have been fruitful in learning fixed neighborhood credits.

Then, at that point, they plan a mostly named factor graph(PFG) to retain every one of the three parts of client level ascribes for client stress discovery. FGM has been broadly utilized in interpersonal organization displaying. It is successful in holding social relationships for different estimating assignments. The contributions of this paper are as follows.

- They suggest a consolidation half breed model incorporating FGM with CNN to hold both of the data of tweet ascribes and social cooperations to improve pressure location.
- They assemble a few focused twitter-posting datasets by various rooted-fact naming technologies and

strategies from a few well known web-based media stages and completely eval-uate our proposed strategy on numerous perspectives .

- They complete top to bottom examinations on a true huge scope dataset and acquire experiences on relationships between friendly associations and stress, just as friendly constructions of focused on clients

Table 1. Tweet level attributes summary:

Category	Short Name	#	Description
Linguistic	Positive & Negative Emotion Words	2	Number of positive and negative emotion words
	Positive & Negative Emoticons	2	Number of popular positive and negative emoticons, e.g., ☺ and ☹
	Punctuation Marks & Associated Emotion Words	4	To signify the intensity of emotion four typical punctuation marks ('!', '?', '...', '!') are considered.
Visual	Degree Adverbs & Associated Emotion Words	2	In examples "I feel a little bit sad" and "I feel terribly sad", 'sad' expresses different negative feelings. We use 1-3 to represent neutral, moderate, and severe degree of positive emotions, and the minus to represent the negative ones.
	Five-color theme	15	A combination of five dominant colors in HSV color space, indicating main color distribution of images, has been revealed to be important on human emotions by psychology and art theories.
	Saturation	2	The mean value of saturation and its contrast.
	Brightness	2	The mean value of brightness and its contrast.
	Warm / Cool color	1	Ratio of cool colors with hue (0-360) in the HSV space in [30, 110].
Social	Clear / Dull color	1	Ratio of colors with brightness (0-1) and saturation < 0.6.
	Social Attention	3	Number of comments, retweets, and likes

Table 2. Attribute level attributes summary:

Category	Short Name	#	Description
Posting Behavior	Social Engagement	3	The numbers of @-mentions, @-retweets, and @-replies in weekly tweet postings, indicating one's social interaction activeness with friends.
	Tweeting time	24	The numbers of tweets posted in hours with a 24-dimensional vector.
	Tweeting type	4	Categorize users' tweets into mainly four types based on general categories of social media platforms: (1) Image tweets (tweets containing images); (2) Original tweets (tweets that are originally authored and posted by the user); (3) Information query tweets (tweets that ask questions or ask for help); (4) Information sharing tweets (tweets that contain outside hyperlinks). We use a 4-dimensional vector of the numbers of tweets in the above 4 types respectively to quantify the tweeting type attribute.
Content Style	Tweeting linguistic style	10	Adopt 10 categories from LIWC that are related to daily life, social events, e.g., personal pronouns, home, work, money, religion, death, health, ingestion, friends, and family. We extract words from users' weekly tweet postings, and use a 10-dimensional vector of numbers of words in the 10 categories
	Words	10	A 10-dimensional integer vector, with each value representing the number of words from social interaction content of users weekly tweet

B. Decision making algorithm

Thilagavathi. P. et al. [2] aim to test results that show that the recommended design can better the location execution. With the assistance of identification they construct a site for the clients to distinguish their pressure rate even out and can check other related exercises.

They said difficulties existed in mental pressure location and furthermore brought up a couple of issues like-1) How to get clients level credits from client's tweeting arrangement and concordat with the issue of nonappearance of methodology in the tweets 2) How to completely hold social communication, including collaboration substance and design designs, for stress discovery?

To handle which challenges, they likewise proposed a factor diagram model FGM.

Model they came up with:

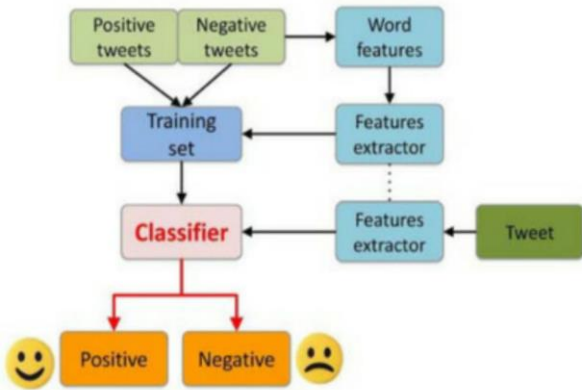


Fig. 2 Model for decision making algorithm

The author of this paper also tells certain key areas to work on. They are as follows:

- About loading text data and cleansing them-discarding the punctuations as well as the non-words.
- About evolving the vocabulary.
- About putting together the movie reviews which uses cleaned and a predefined vocabulary and then save them to new files ready for modeling[5].
- The data collections' goal is to capture evidence with quality that allows analysis which lead to the formulation of convincing and incredible answers to the questions that have been put forward.

C. BIRCH

algorithm

Kanaka P. et al. [3] expect to test for trade by utilizing open source libraries and previous calculations to help make this unusual arrangement somewhat more unsurprising. Information investigation, key examination, execution are utilized.

The creators of this paper accepted that information mining was the PC helped measure developed through and examined enormous arrangements of information and afterward took out the importance of the information. Information mining instruments gauge practices and future patterns, which permitted organizations to make proactive, information driven choices[1]. Information mining instruments could respond to business questions that ordinarily were an excessive amount of time taking to determine. They cleaned data sets for covered up designs, discovered forecastive data that specialists may miss since it lied outside their assumptions

They expanded the proposed algorithm[1] which inspects the understudy's learning encounters by offering answers for their issues. The set forward arrangements were passed to the understudy's personal email-ids to achieve the protection of the understudy and for the betterment security a novel secure calculation called BIRCH is proposed. At long last they got the input from the understudies about the arrangement gave and henceforth the examination chart was created.

The system model proposed by the author of this paper:

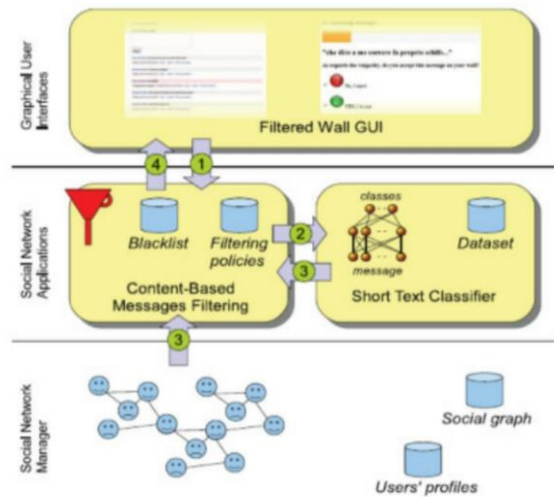


Fig. 3 Content based model

The advantages of the proposed system are:

- Each bunching choice were made without checking all information focuses and right now existing groups
- It used the examination that information space was not for the most part equitably occupied and only one out of every odd information point was indistinguishably huge.

D. RNN and CNN

Simhadri Naga Mounika. et al. [4] aim to predict stress levels based on the social media feed using RNN The authors recommend a system which splits in different modules.

The figure below depicts how the problem works in different steps. At first the input is taken i.e., raw data which is taken out from twitter. Then that raw data will be preprocessed. Then, sentiment analysis is performed to that preprocessed data via the Recurrent Neural Network (RNN) Algorithm[10]. Then after the accuracy is put out, the data classification is done based on its sentiment [2].

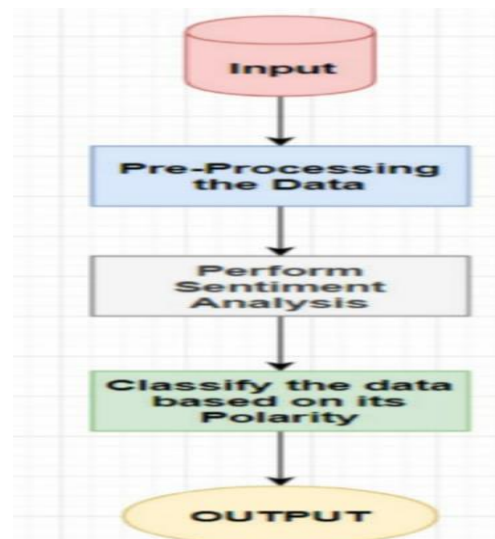


Fig. 4 General work flow

They also gave out the comparative study i.e., they also found out the sentimental analysis based on three factors i.e., positive, negative and neutral[1]. the results are given below

Table 3. Comparative study

Student Username		nagamounika246	kanumuriprem	sharithak
R N N	Positive	42.9	21.2	28.6
	Negative	35.7	24.2	42.9
	Neutral	21.4	54.2	28.6
	Accuracy	79.1	73.5	81.6
C N N	Positive	46.5	16.8	25.3
	Negative	35.0	25.0	41.2
	Neutral	19.8	50.6	16.8
	Accuracy	55.3	61.4	69.8

They came to the conclusion that two out of every three students they identified were stressed.

As a result, they have taken additional safeguards for stressed persons and have also assisted them in overcoming their tension.

They suggested that the next step in this research would be to use deep neural networks to predict stress with greater accuracy[6].

III. MODEL FRAMEWORK OF THE BEST TECHNIQUE

Two challenges persist in detecting psychological stress.

1)Approaches to complete Tweet-level research feeling identification in a friendly system or criss-cross. Computer-supported detection,analysis, and utilization of feeling, particularly in informal communities, have attracted a lot of consideration in the late years[9]. Relationships between mental pressure and character attributes can be a fascinating issue to consider . eg;providing confirmation that regular deliberately, stress can be instantly perceived dependent on conduct metrics.Extracting clients level ascribes from client's arrangement of tweets[1]

2)How to completely hold collaboration socially, including cooperation substance and design designs, for stress identification? To handle these difficulties, they propose a factor model diagram[1]

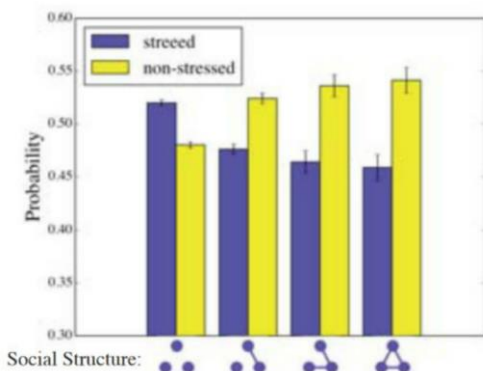


Fig. 5 Sampling test

Table 4. Summary of the paper reviewed

Title	Technique	Advantage	Conclusion
Paper by Huijie Lin. et al. [1]	FGM and CNN	There won't be any redundancy in the data as it does preprocessing of the data	the number of social structures of sparse connection was greater.
Paper by Thilagavathi. P. et al. [2]	Decision making algorithm	Makes use of labelled data sets leveraging both user level and tweet level attributes.	Found the relationship between the users stress state and social media interactions
Paper by Kanaka P. et al. [3]	BIRCH algorithm	full utilization of memory to derive the best possible sub-clusters while keeping down I/O costs.	Provides workflow for scrutinizing social data for educational purposes or for researchers
Paper by Simhadri Naga Mounika. et al. [4]	RNN and CNN	Because of using RNN it becomes very easy, eliminating all redundant steps	for every three tested, two were detected with stress.

● CONCLUSION

We are introducing a system for recognizing clients' mental pressure states/levels from week after week online media information of the clients, holding tweets' substance just as associations of the clients in web-based media stages. Drawing in real information from online media as the premise, we likewise take a gander at the association between clients' mental feeling of anxiety and their practices in friendly collaboration. To take full hold of them, suggested a hybrid model that combines the factor diagram model (FGM) with a convolutional neural organisation to combine both substance and social communication data/information of clients' tweets (CNN).

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