

Social Network Mental Disorders Detection via Online Social Media Mining

Hardik kathed¹, Ashish Dixit², Shubham Bhongale³, Vishvabhushan Gaikwad⁴

^{1,2,3,4}Department of Computer Engineering, SKN Sinhgad Institute of Technology and Science Lonavala, Maharashtra, India

Abstract - Mental disorders are becoming a threat to people's health now days. With the rapid pace of life, more and more people are feeling stressed. It is very hard to detect users mental disorders in an early time to protect user. An increasing number of social network mental disorders (SNMDs), such as Cyber-Relationship Addiction, Information Overload, and Net Compulsion, have been recently noted. Symptoms of these mental disorders are usually observed passively today, resulting in delayed clinical intervention .With the increase in use of electronic long range interpersonal communication, people are accustomed to sharing their step by step exercises and interfacing with companions by means of online systems administration media stages, making it conceivable to utilize online informal community information for stress discovery. Through our system, 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. Various aspects of social network mental disorders are defined using a set of stress-related textual, visual, and social attributes , I proposed a system using CNN by which we can do sentiment analysis of facebook post, after Formation of topic using Transductive Support Vector Method(TSVM) we can classify user are in detecting mental disorders or not. After classification user are in mental disorders or not k-nearest neighbour's algorithm (KNN) is used for recommendation of hospital on a map as well as Admin can send mail of precaution list for user to become healthy and happy in life.

during social interaction. The second is Social Interaction: people are known to social interaction of user. Through the advancement of social networks like Instagram Post dataset, Facebook post dataset, people share their every day events and moods, and interact with friends through the social networks in an ever increasing number. User are in stress or not can be classified using support vector method. Due to leverage both facebook post content attributes and social interactions helps to enhance stress detection. After getting mental disorders level, system can recommended user hospital for further treatment, Admin can show that hospital on map and system also recommended to take precaution for avoid mental disorder.

2. LITERATURE SURVEY

H. Lin et al [1] states the around a programmed pressure recognition strategy from cross-media microblog data. Structure of three levels for pressure location from cross-media microblog information. By consolidating a Deep Sparse Neural Network to fuse distinctive highlights from cross-media microblog information, the system is very possible and effective for push detection. This structure, the proposed technique can help to consequently recognize mental worry from informal organizations. H. Lin intend to examine the social relationships in mental worry to additionally enhance the identification execution.

Liqiang Nie et al [2] proposed about bridging the vocabulary hole between wellbeing searchers and human services information with a worldwide learning approach. A therapeutic phrasing task plan to connect the vocabulary hole between wellbeing searchers and social insurance information. The plan includes two segments, neighborhood mining and worldwide learning .Extensive assessments on a true dataset show that our plan can create promising execution when contrasted with the overarching coding techniques. Liqiang Nie will explore how to adaptably compose the unstructured restorative substance into client needs-mindful cosmology by utilizing the suggested therapeutic wordings.

Chi Wang et al [3] introducing an find out around an impact boost issue, which expects to locate a little subset of hubs (clients) in an interpersonal organization that could expand the spread of impact. A Pairwise Factor Graph (PFG) model to formalize the problem in probabilistic model, and Chi Wang extend it by incorporating the time

1. INTRODUCTION

A mental disorder is turning into a risk to individual's well-being these days. With the fast pace of life, progressively and more individuals are feeling stressed. With the explosive growth in popularity of social networking and messaging apps, online social networks (OSNs) have become a part of many people's daily lives. Excessive and chronic stress can be rather harmful to people's physical and mental health. Users' social interactions on social networks contain useful cues for mental disorders detection. Social psychological studies have made two interesting observations. The first is mood contagions: a bad mood can be transferred from one person to another

information, which results in the Dynamic Factor Graph (DFG) mode. The proposed approach can effectively discover the dynamic social influences. Parallelization of our algorithm can be done in future work to scale it up further.

Lexing Xie and Xuming He.[4] have presented about Picture labels and world information: taking in label relations from visual semantic sources examines the utilization of regular words to depict pictures. The proposed labeling calculation sums up to concealed labels, and is additionally enhanced joining tag-connection highlights acquired by means of ICR. Techniques to better fuse multi-word terms and out-of vocabulary words; propelled NLP procedures for taking in word relations from freestyle content; assessment of idle idea connection recommendation, and anticipating the kind of relations.

Yuan Zhang et al [5] proposed learn a novel problem of emotion prediction in social networks. A strategy alluded to as Moodcast for demonstrating and foreseeing feeling flow in the informal organization. The new approach can enough show each customer's inclination status and the desire execution is better than a couple of benchmark procedures for feeling forecast. It is used to as a result of the set number of individuals. For display learning, it utilizes a Metropolis-Hastings calculation to get a rough arrangement. Trial comes about on two diverse genuine informal communities exhibit that the proposed approach can successfully display every client's feeling status and the forecast execution is superior to a few standard strategies for feeling expectation.

Michela Ferron et al [6] presented Studies about Daily pressure acknowledgment from cell phone information, climate conditions and individual attributes. That step by step pressure can be constantly seen in perspective of behavioral measurements. This is got from the customer's mobile phone activity what's more, from additional markers, for instance, the atmosphere conditions (data identifying with fleeting properties of the condition) and the character characteristics. Stress has turned into a major issue influencing profitability in workplaces, prompting word related issues and causing wellbeing diseases. This framework could be broadened and utilized for early discovery of stress-related clashes and stress virus, and for supporting adjusted workloads.

Dan C Ciresan et al [7] introduced an new deep CNN architecture, MaxMin-CNN, to better encode both positive and negative filter detections in the net. Dan C Ciresan propose to adjust the standard convolutional square of CNN keeping in mind the end goal to exchange more data layer after layer while keeping some invariance inside the system. Our fundamental thought is to abuse both positive and negative high scores got in the convolution maps. This conduct is acquired by altering the customary enactment work venture before pooling1. Time required for this is more. It is time consuming process.

Jennifer Golbeck et al [8] presented an inspired by the personality of customers. Character has been seemed, by all accounts, to be appropriate to numerous sorts of collaborations. Jennifer Golbeck are occupied with the personality of customers. Character has been had all the earmarks of being pertinent to numerous sorts of collaborations; it has been seemed, by all accounts, to be useful in suspecting work fulfillment, relationship accomplishment, and even slant. Cristina Robles are charmed in the character of customers. Character has been gave off an impression of being pertinent to numerous sorts of interchanges; it has been seemed, by all accounts, to be important in predicting work satisfaction, master and nostalgic relationship accomplishment, and even slant for different interfaces. Michon Edmondson can start to answer more modern inquiries concerning how to introduce trusted, socially-important, and top notch data to clients.

Quan Guo et al [9] introduced about an adapting intense uniform features for cross-media social data by using cross auto encoders. To handle learning models to address issue handle the cross-strategy associations in cross-media social segments. Quan Guo propose CAE to learn uniform strategy invariant features, and Jia propose AT and PT stages to utilize immense crossmedia data tests and set up the CAE. Adapting effective uniform features for cross-media social data by using cross auto encoders take an extra time.

Sepandar D. Kamvar [10] have introduced an studies about any person feel fine and searching the emotional web. Feel fine to suggest a class of visualizations which is called as Experiential Data Visualization. The focus is on immersive item-level interaction with data. The implications of such visualizations for crowdsourcing qualitative research in the social sciences. Repeated information in relevant answers requires the user to browse through a huge number of answers in order to actually obtain information. To date, most research in assessment examination has been engaged on calculations to extricate, order, and condense conclusion.

3. METHODOLOGY USED IN PROPOSED SYSTEM

1. Methodology

- Natural Language Processing focuses on the field of study of interactions between human language and computers. Natural Language Processing contain different techniques like:
- **Sentiment Analysis:** process of determining whether a piece of writing is positive, negative or neutral, deriving the opinion or attribute of a user. It is also known as opinion mining. This technique is used for discovering how people feel about particular topic. Natural Language Processing for sentiment analysis focused on emotions is extremely useful.

- **Topic Extraction:** one of the most important tasks when working with text is Extracting topic. In this technique, clustering about a similar topic occur in a collection of documents or an information, from this we get more accurate information. Readers get benefit from topic keywords as they can judge more quickly whether the text is worth reading or not. Website creators benefit from topic keywords because they can group similar content by its topics.
- **Part-Of-Speech Tagging:** It is a piece of software that reads text in some language and assigns parts of speech to each word based on both its definition and its context—i.e., its relationship with adjacent and related words in a phrase, sentence, or paragraph. A simplified form of this is commonly taught to school-age children, in the identification of words as nouns, verbs, adjectives, adverbs, etc. Many words, especially common ones, can serve as multiple parts of speech. For example, "book" can be a noun ("the book on the table") or verb ("to book a flight"); "set" can be a noun, verb or adjective; and "out" can be any of at least five different parts of speech.
- **Stemming:** Stemming is the process of reducing inflected words to their word stem, base or root form generally a written word form. The stem need not be identical to the morphological root of the word; it is usually sufficient that related words map to the same stem, even if this stem is not in itself a valid root. for example, should identify the string "cats" (and possibly "catlike", "catty" etc.) as based on the root "cat", and "stems", "stemmer", "stemming", "stemmed" as based on "stem". A stemming algorithm reduces the words "fishing", "fished", and "fisher" to the root word.

2. Support Vector Machine Algorithm

In machine learning, support vector machines (SVMs, likewise support vector machines systems) are administered learning models with related learning calculations that examine information utilized for order and relapse investigation. Given an arrangement of preparing cases, each set apart as having a place with either of two classes, a SVM preparing calculation fabricates a model that doles out new cases to one class or the other, making it a non probabilistic two fold straight classifier (in spite of the fact that strategies, for example, Platt scaling exist to utilize SVM in a probabilistic arrangement setting). Utilizing this calculation we can characterized the positive or a negative post .after characterization we predict user are in stressed or not.

Input:-User facebook post

Algorithm Steps:

- Step1:** SVMs augment the edge around the separating hyperplane. Assume linear separability for now: in 2 dimensions, can separate by a line in higher dimensions, need hyperplanes Can find separating hyperplane by linear programming (e.g. perceptron): separator can be expressed as $ax + by = c$
- Step2:** The decision function is fully specified by a subset of training samples, the support vectors.
- Step3:** Quadratic programming problem
- Step4:** Text classification method For example, A combination of these 0s and 1s in the feature vector along with the known label will be the Training input to our SVM classifier. It should be noted that the label in the feature vector should be numeric only or the SVM classifier. Finally we can get 0 for positive, 1 for negative and 2 for neutral labels.

Output:-Classified user stress positive post or negative post

3. KNN (K Nearest Neighbours) algorithm

In design acknowledgment KNN is a non-parametric method used for classification and regression. In both cases, the input consists of the k closest training examples in the feature space. The output depends on whether k-NN is used for classification or regression. Using this KNN algorithm we can recommendation of hospital to user on a map also show shorted distance from a current location to that hospital on goggle map.I also recommendation of precaution according to level of user stress.

Step1 :-Find k most similar users (KNN).

Step2:-Identify set of items, C, Visited by the group of user together with their frequency.

Step3:-Recommend the top N- most frequent items in C that the active user visited or not.

4. A Convolutional Neural Network (CNN)

A Convolutional Neural Network (CNN) is contained at least one convolutional layers (frequently with a subsampling step) and after that took after by at least one completely associated layers as in a standard multilayer neural system. The engineering of a CNN is intended to exploit the 2D structure of an information picture (or other 2D information, for example, a discourse flag). This is accomplished with nearby associations and tied weights took after by some type of pooling which brings about interpretation invariant highlights. Another advantage of CNNs is that they are less demanding to prepare and have

numerous less parameters than completely associated systems with a similar number of concealed units.

Input: - User facebook post.

Output:-Extraction of topic.

In a proposed system architecture we can detect user are in mental disorders or not due to interaction social network. In a social network contain facebook, twitter.on a facebook user are interact with other people. User can different posts on a facebook. There are three types of information that we can use as the initial inputs, i.e, facebook-level attributes, user-level posting behaviour attributes, and user-level social interaction attributes. I first define a set of stress-related textual, visual, and social attributes from various aspects in social network mental disorders (SNMDs), Facebook-level attributes describe the linguistic i.e. positive and negative words and visual content like brightness, cool color, dull color, as well as social attention factors (being liked, commented,) of a single facebook post. User level posting behavior attributes as summarized from a user's montly facebook postings, post time, post type; social interaction attributes extracted from a user's social interactions with friends. In particular, the social interaction attributes can further be broken into: (i) social interaction content attributes extracted from the content of users' social interactions with friends like words and emotions; and (ii) social interaction structure attributes extracted from the structures of users' social interactions with friends. On this user input post we can fetch user level facebook post features On that input of facebook post .Conventional neural network(CNN)* is used for topic extraction. Using CNN we can sentiment analysis of facebook post after Formation of topic Using Transductive Support Vector Method(TSVM) we can classified user are in stress or not. After classification user are in stress or not k-nearest neighbours algorithm (KNN) is used for recommendation hospital on a map as well as Admin can send mail of precaution list for user for become healthy and happy in life.

In a proposed system architecture we can detect user are in mental disorders or not due to interaction social network. In a social network contain facebook, twitter.on a

facebook user are interact with other people. User can different posts on a facebook. There are three types of information that we can use as the initial inputs, i.e, facebook-level attributes, user-level posting behaviour attributes, and user-level social interaction attributes. I first define a set of stress-related textual, visual, and social attributes from various aspects in social network mental disorders (SNMDs), User level posting behavior attributes as summarized from a user's montly facebook postings, post time ,post type; social interaction attributes extracted from a user's social interactions with friends. In particular, the social interaction attributes can further be broken into: (i) social interaction content attributes extracted from the content of users' social interactions with friends like words and emotions; and (ii) social interaction structure attributes extracted from the structures of users' social interactions with friends. On this user input post we can fetch user level facebook post features On that input of facebook post .Conventional neural network(CNN)* is used for topic extraction. Using CNN we can sentiment analysis of facebook post after Formation of topic Using Transductive Support Vector Method(TSVM) we can classified user are in stress or not. After classification user are in stress or not k-nearest neighbours algorithm (KNN) is used for recommendation hospital on a map as well as Admin can send mail of precaution list for user for become healthy and happy in life.

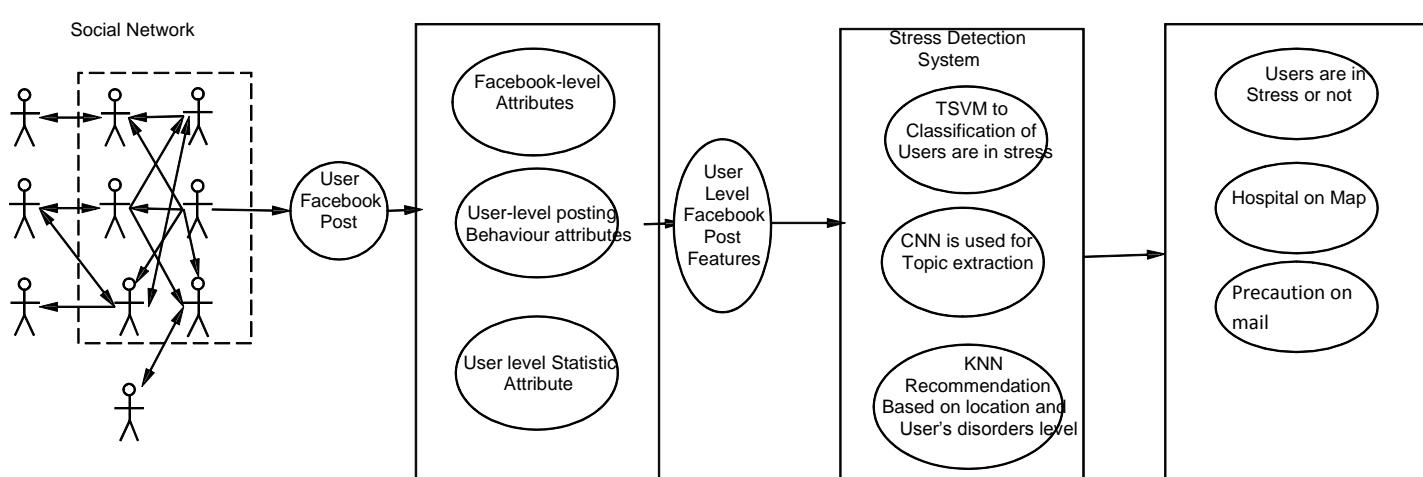


Fig. Proposed System Architecture

In proposed system experimental setup, we identified that in proposed system number stressed user and number of non-stressed. In a following table, 35 user are in stressed and 40 non-stressed user.

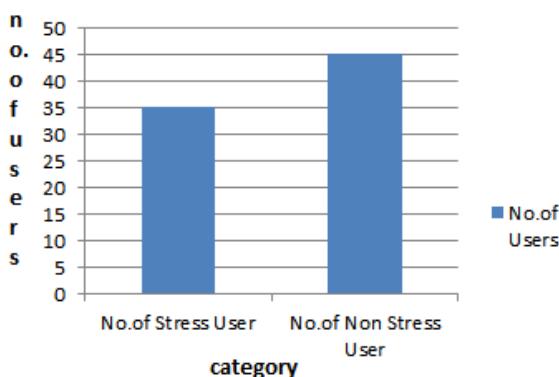
Sr.No	No. Stressed User	No. Non-Stressed User
1	35	45

Table1: Stressed and Non-Stressed User

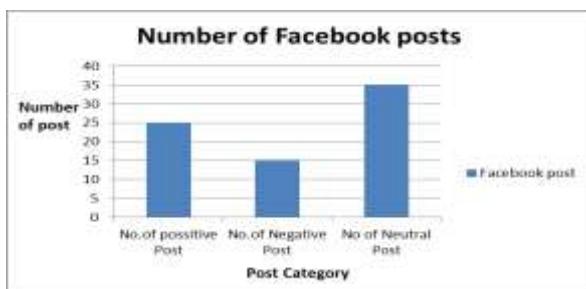
Sr.No	No. Positive Post	No. Negative Post	No.Neutral Post
1	25	15	35

Table2: Number of Facebook Posts

From above table, in proposed system, following graph shows The stressed and non-stressed user in the graph; we see 35 users are in stressed and 45 users in the non-stressed user. In graph 1 shows number of stress user in the graph 1.

Comparison between Stressed and Non-Stressed User**Graph 1: Stressed and Non-Stressed User**

From below graph 2, in proposed system, number of post from facebook where In proposed system above graph we identified total 75 posts from Facebook in that in proposed 25 post are positive 15 post are negative and 35 post are neutral



4. CONCLUSION

Mental disorders is threatening people's health. It is non-trivial to detect mental disorders or stress timely for proactive care. Therefore we presented a framework for detecting users' psychological stress states from users' mostly social media data, leveraging facebook post' content as well as users' social interactions. Employing real-world social media data as the basis, we studied the correlation between user' psychological stress states and their social interaction behaviors. I recommended the user for health consultant or doctor. I can show the hospitals for further treatment on a graph which locate shortest path from current location user to that hospital.

I recommended the user for health precaution send on mail for user interaction purpose..

5. REFERENCES

- [1] H. Lin, J. Jia, Q. Guo, Y. Xue, J. Huang, L. Cai, and L. Feng. Psychological stress detection from cross-media microblog data using deep sparse neural network. In proceedings of IEEE International Conference on Multimedia & Expo, 2017.
- [2] Liqiang Nie, Yi-Liang Zhao, Mohammad Akbari, Jiale Shen, and Tat-Seng Chua. Bridging the vocabulary gap between health seekers and healthcare knowledge 2016
- [3] Chi Wang, Jie Tang, Jimeng Sun, and Jiawei Han Dynamic social influence analysis through time-dependent factor graphs IEEE 2014
- [4] Lexing Xie and Xuming He. Picture tags and world knowledge: learning tag relations from visual semantic sources 2015
- [5] Yuan Zhang, Jie Tang, Jimeng Sun, Yiran Chen, and Jinghai Rao. Moodcast: Emotion prediction via dynamic continuous factor graph model 2016 IEEE International Conference on Data Mining
- [6] Andrey Bogomolov, Bruno Lepri, Michela Ferron, Fabio Pianesi, and Alex Pentland. Daily stress recognition from mobile phone data, weather conditions and individual traits. In ACM International Conference on Multimedia, pages 477–486, 2014.
- [7] Dan C Ciresan, Ueli Meier, Jonathan Masci, Luca Maria Gambardella, and Jürgen Schmidhuber. Flexible, high performance convolutional neural networks for image classification. In Proceedings of International Joint Conference on Artificial Intelligence, pages 1237–1242, 2011.
- [8] Jennifer Golbeck, Cristina Robles, Michon Edmondson, and Karen Turner. Predicting personality from twitter. In Passat/socialcom 2011, Privacy, Security, Risk and Trust, pages 149–156, 2013
- [9] Quan Guo, Jia Jia, Guangyao Shen, Lei Zhang, Lianhong Cai, and Zhang Yi. Learning robust uniform features for cross-media social data by using cross autoencoders. Knowledge Based System, 102:64–75, 2016.
- [10] Sepandar D. Kamvar. We feel fine and searching the emotional web. In In Proceedings of WSDM, pages 117–16, 2013