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Knowledge-Based Recommendation System using advanced machine learning

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Abstract— Stress and Depression is one of the most widely recognized and handicapping mental issue that relevantly affects society. Automatic health monitoring systems could be crucial and important to improve depression and stress detection system using social networking. Sentiment Analysis alludes to the utilization of natural language processing and content mining approaches planning to recognize feeling or opinion. Full of feeling Computing is the examination and advancement of frameworks and gadgets that can perceive, decipher, process, and mimic human effects. Sentiment Analysis and deep learning techniques could give powerful algorithms and frameworks to a target appraisal and observing of mental issue and, specifically of depression and stress. In this paper, the application of sentiment analysis and deep learning methodologies to depression and stress detection and monitoring are discussed. In addition, a fundamental plan of an incorporated multimodal framework for stress and depression checking, that incorporates estimation investigation and full of feeling processing strategies, is proposed. In particular, the paper traces the fundamental issues and moves comparative with the structure of such a framework.

Keywords – stress and depression; ehealth; sentiment analysis, social media, deep learning.

I. INTRODUCTION

Social media is arguably the richest source of human generated text input. Opinions, feedbacks and critiques provided by internet users reflect attitudes and sentiments towards certain topics.This paper presents a knowledge-based system, which includes an emotional health monitoring system to detect users with possible psychological disorders specially depression and stress. Symptoms Of these psychological disorder are usually observed passively. In this situation, author argue that online social behaviour extraction offers an opportunity to actively identify psychological disorder at an early stage. It is difficult to identify the disorder because the psychological factors considered in standard diagnostic criteria questionnaire cannot be observed by the registers of online social activities.

Depression and stress is one of the most common and disabling mental disorders, and has a relevant impact on society. Currently, methods for depression and stress detection and diagnosis rely on self-reporting coupled with the health care practitioners informed assessment. The provision of effective health monitoring systems and diagnostic aids could be crucial and important to improve health professional's work and lower healthcare costs. Sentiment and deep learning technology could help to tackle these objectives by providing effective tools and systems for objective assessment. Such tools and systems do not aim to replace the psychologist or psychiatrist but they could support their decisions.

Our approach, New and innovative for the practice of psychological disorder detection, it does so do not trust the self-disclosure of those psychological factors through the questionnaires. Instead, propose a machine learning technique that is detection of psychological disorder in social networks which exploits the features extracted from social network data for identify with precision possible cases of disorder detection. We perform an analysis of the characteristics and we also apply machine learning in large-scale data sets and analyse features of the two types of psychological disorders.

II. Related Work

Renata L. Rosa, Gisele M. Schwartz, Wilson V. Ruggiero, and Dem´ostenes Z. Rodr´ıguez - Online social networks (OSN) provide relevant information on users' opinion about different themes. Thus, applications, such as monitoring and recommendation systems (RS) can collect and analyze this data. This paper presents a Knowledge-Based Recommendation System (KBRS), which includes an emotional health monitoring system to detect users with potential psychological disturbances, specifically, depression and stress.

Guang Yang, Haibo He, Fellow, IEEE, and Qian Chen - Sentiment analysis on microblog posts has been studied in depth, sentiment analysis of posts is still challenging because of the limited contextual information that they normally contain. In microblog environments, emoticons are frequently used and they have clear emotional meanings. They are important emotional signals for microblog sentimental analysis. They address this issue by constructing an emotional space as a feature representation matrix and projecting emoticons and words into the emotional space based on the semantic composition.

M. Al-Qurishi, M. S. Hossain, M. Alrubaian, S. M. M. Rahman, and A. Alamri - In this paper, author propose an integrated social media content analysis platform that leverages three levels of features, i.e., user-generated content, social graph connections, and user profile activities, to analyze and detect anomalous behaviors that deviate significantly from the norm in large-scale social networks. Several types of analyses have been conducted for a better understanding of the different user behaviors in the detection of highly adaptive malicious users.

Huijie Lin, Jia Jia, Jiezhon Qiu, Yongfeng Zhang, Lexing Xie, Jie Tang, Ling Feng, and Tat-Seng Chua - In this paper, 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 - a factor graph model combined with Convolutional Neural Network to leverage tweet content and social interaction information for stress detection.

Budhaditya Saha, Thin Nguyen, Dinh Phung, Svetha Venkatesh - Mental illness has a deep impact on individuals, families, and by extension, society as a whole. Social networks allow individuals with mental disorders to communicate with others sufferers via online communities, providing an invaluable resource for studies on textual signs of psychological health problems. Mental disorders often occur in combinations, e.g., a patient with an anxiety disorder may also develop depression.

Chun-Hao Chang, Elvis Saravia, Yi-Shin Chen - In this paper, aim at building predictive models that leverage language and behavioral patterns, used particularly in social media, to determine whether a user is suffering from two cases of mental disorder. These predictive models are made possible by employing a novel data collection process, coined as Subconscious Crowdsourcing, which helps to collect a faster and more reliable dataset of patients. Our experiments suggest that extracting specific language patterns and social interaction features from reliable patient datasets can greatly contribute to further analysis and detection of mental disorders.

Andrey Bogomolov, Bruno Lepri, Michela Ferron, Fabio Pianesi, Alex (Sandy) Pentland- In our paper, propose an alternative approach providing evidence that daily stress can be reliably recognized based on behavioral metrics, derived from

the user's mobile phone activity and from additional indicators, such as the weather conditions (data pertaining to transitory properties of the environment) and the personality traits (data concerning permanent dispositions of individuals). Our multifactorial statistical model, which is person-independent, obtains the accuracy score of 72.28% for a 2-class daily stress recognition problem. The model is e_cient to implement for most of multimedia applications due to highly reduced low dimensional feature space (32d). Moreover, we identify and discuss the indicators which have strong predictive power.

Bimal Viswanath† Alan Mislove Meeyoung Cha Krishna P. Gummadi – In this paper, study the evolution of activity between users in the Facebook social network to capture this notion. Also find that links in the activity network tend to come and go rapidly over time, and the strength of ties exhibits a general decreasing trend of activity as the social network link ages. For example, only 30% of Facebook user pairs interact consistently from one month to the next. Interestingly, and find that even though the links of the activity network change rapidly over time, many graph-theoretic properties of the activity network remain unchanged.

I.-R. Glavan, A. Mirica, and B. Firtescu - Social media tools are wide spread in web communication and are gaining popularity in the communication process between public institutions and citizens. This study conducts an analysis on how social media is used by Official Statistical Institutes to interact with citizens and disseminate information. A linear regression technique is performed to examine which social media platforms (Twitter or Facebook) is a more effective tool in the communication process in the official statistics area. Our study suggests that Twitter is a more powerful tool than Facebook in enhancing the relationship between official statistics and citizens, complying with several other studies. Next, performed an analysis on Twitter network characteristics discussing “official statistics” using NodeXL that revealed the unexploited potential of this network by official statistical agencies.

III. PROPOSED APPROACHES

In the proposed systemic approach, we formulate the task as a classification problem to detect four types of detection of psychological disorders in social networks using the sentiment analysis and ssdeep learning framework:

i. Stress
ii. Depression
iii. Positive comments
iv. Negative comments

An innovative solution to monitor and detect potential users with emotional disorders, according to the classification of sentences with depressed or stressed content.

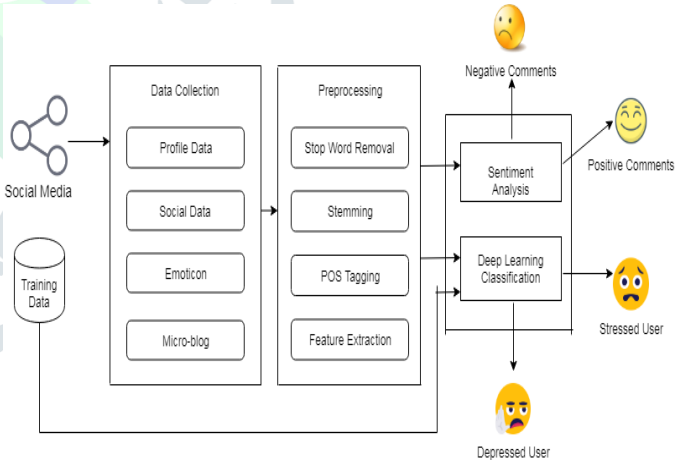

Fig. System Architecture

Proposed Algorithm:

Naive Bayes

Steps:

- Given training dataset D which consists of documents belonging to different class say Class A and Class B
- Calculate the prior probability of class A=number of objects of class A/total number of objects

- Calculate the prior probability of class B=number of objects of class B/total number of objects

- Find NI, the total no of frequency of each class
  - Na=the total no of frequency of class A
  - Nb=the total no of frequency of class B
- Find conditional probability of keyword occurrence given a class:
  - P (value 1/Class A) =count/ni (A)
  - P (value 1/Class B) =count/ni (B)
  - P (value 2/Class A) =count/ni (A)
  - P (value 2/Class B) =count/ni (B)
  - ……..
  - ……..
  - ……..
  - P (value n/Class B) =count/ni (B)
- Avoid zero frequency problems by applying uniform distribution
- Classify Document C based on the probability p(C/W)
- Find P (A/W) =P (A)*P (value 1/Class A)* P (value 2/Class A)……. P(value n /Class A)
- Find P (B/W) =P (B)*P (value 1/Class B)* P(value 2/Class B)……. P(value n /Class B)
- Assign document to class that has higher probability.

IV. RESULTS AND DISCUSSION

Experiments are done by a personal computer with a configuration: Intel (R) Core (TM) i5-2120 CPU @ 3.30GHz, 8GB memory, Windows 10, MySQL backend database and jdk 1.9. The application is dynamic web application for design code in Eclipse Oxygen IDE and execute on Tomcat server 9.5. The overall accuracy of Naïve bayes classification technique. So this works gives better classification results.

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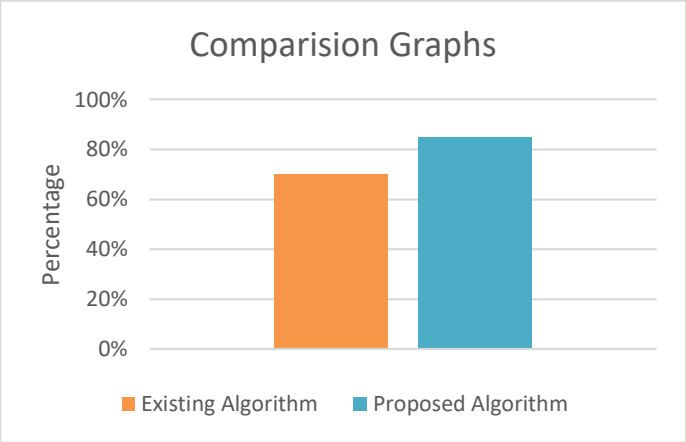

Fig2. Graph

A. Comparison Table:

Sr.No	Existing Algorithm (TSVM)	Proposed Algorithm(NB)
1	65%	86%

Table 1.comparative result

Conclusion

In this proposed system, automatically identifying potential online users with depression and stress is threatening people's health. Thus users suffering from depression can be identified and they might be helped before they take any drastic steps which might have a long lasting impact. Using the data of the social networks of the real world as a basis, we study the correlation between the states of psychological disorder of users and their social interaction behaviour we recommend the user for health precautions to send by mail for user interaction.

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Author[s] brief Introduction

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