EasyChair Preprint

№ 1948

# Stress Detection of User using Social Interaction

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November 13, 2019

# STRESS DETECTION OF USER USING SOCIAL INTERACTION

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**Abstract-** Mental stress is becoming a threat to people's health now a days. With the rapid pace of life, more and more people are feeling stressed. It is not easy to detect users stress in an early time to protect user [1]. We determined that students stress state is firmly diagnosed with that of his/her activities in on-line lifestyles.
We initially load the data from dataset named as "Sentiment_140" from Kaggle and visualize properties from different viewpoints and afterward propose a Naïve Bayes algorithm - It is a classification technique based on **Bayes**' Theorem with an assumption of independence among predictors i.e. presence of a particular feature in a class is unrelated to the presence of any other feature.

By further breaking down the tweets, we performed tokenization process from textual comment content and make word cloud, then result will come from these words that whether your tweet is depressive or not and these task is done by tweet classifier which identifies depressive or not depressive words from your text comments.

**Key words: Stress detection, social media, micro-blog, access tokens, and face book.**

## 1. INTRODUCTION

It is said that social media is the defining element of the so-called "net generation" — those who grew up with Information and Communications Technology (ICT). The importance of social media to the young is evident in a 2014 report which noted that 86% of internet uses who are between 18-29 years old use social networking sites[2].The study reveals that about 95% of total citizens in India are always active on social media networks like Twitter, Facebook and Instagram etc. Customer's social interactions on social networks contain beneficial cues for stress detection. Social psychological studies have made thrilling observations. The first is mood contagions: a terrible mood may be transferred from one person to any other at some stage in social interaction. The second social interaction: humans are acknowledged to social interaction of user. Many studies on social media based emotion analysis are at the tweet level, using text-based linguistic features and classic classification approaches.
This project focuses on building a user-friendly Web app, which could later be used as a utility software or extension that allows citizens to know whether their thoughts are depressive or not, which can later be easily accessed and diagnosed. The app is a web application and is mainly for citizens, allowing easy sharing of information related to depressive thoughts of a person via their tweets on a social media network, like Twitter. In a country like India, this problem is to be addressed as soon as possible.

## 2. LITERATURE SURVEY

In 21st century where everything is technology driven, things can be viewed on the social media in seconds. The study reveals that about 92% of population in India are addicted to social networking sites and apps. The users spend most of their time in surfing social media and come across mental stress. This mental stress caused due to social interactions on social networking platforms leads to serious mental conditions like Depression. Thus, stress detection system mainly targets this problem and addresses a technology – efficient solution to it. Emotional anxiety is threatening individual's wellness. It is non-trivial to spot stress and anxiety timely for proactive care. With the popularity of social media, people are utilized to sharing their daily tasks as well as engaging with buddies on social media platforms, making it practical to utilize online social media network data for anxiety discovery.

The current systems are addressing problems of stress detection but are inefficient in fulfilling all the requirement of the users. The users does not get any response about the audio Tweets by the system. The users also have to face some problems in viewing the state of Tweets in accordance with the depressiveness in the current systems. The User Interface of these web Apps available so far are also not user-friendly and easy to access for a user. The accuracy of checking upon Tweets/Comments for depressiveness is maintained however is low in some of the current systems available for Stress Detection

Stress detection system in real time is a tedious task and is not achieved by number of systems available. The Web Apps available so far doesn't have easy to access and user – friendly UI that could temp user to use it for checking upon depressiveness. Government reach to data is only through manual surveys related to depression cases reported in hospitals wherein citizens are least involved. The statisitics mapped are either not reachable or are not feasible, thus collecting data and analyzing it becomes difficult and tedious.

## 3. PROPOSED WORK

Mental stress is undermining individuals' wellbeing. It is important to recognize stress convenient for proactive consideration. With the notoriety of social media based life, individuals are accustomed to sharing their day by day exercises and communicating with companions via web-based social networking media stages, making it plausible to use online interpersonal organization information for stress discovery.

We found that users stress state is firmly identified with that of his/her friends in online life, and we utilize an enormous scale dataset from true social stages to methodically think about the relationship of users' stress states and social associations. We initially characterize a lot of stress related printed, and social properties from different viewpoints, and afterward propose a novel trained model joined with the Naïve Bayes Classifier to use social media Tweets and social association data for stress detection. By further breaking down the social association information, we likewise find a few captivating marvels, the substance of social communications, e.g., textual comment content, while disregarding the intrinsic auxiliary data like how users are associated.

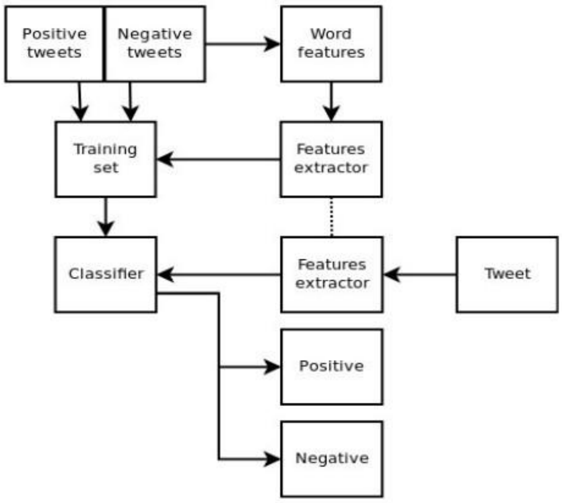



**Fig. 1 System Architecture**

The main motto of this system is to reduce the manual efforts made till now in the process of Stress detection through long and lengthy surveys. Thus, this project is operationally feasible and very – efficient, the operational feasibility is highly achieved through this system.

## 3.1 PROBLEM STATEMENT

In a country like India, due to lack of timely mental checkup of humans, the rate of social media users suffering from mental illness and depression is gradually increasing. The damage and failure caused by depression and mental illness can cause incidents like suicide as well as uneasiness for relatives as well as friends nearby. The problem addressed here is the lack of proper awareness among the citizens about the power of their social interactions (Tweets over Twitter), the app also deals with the speech of human – beings and the speech is translated to text and then

## 3.2. METHODOLOGY

The selection of tools to be used to build the project is a very important task. The tools used in this project are as follows :

1. **Natural Language Toolkit (NLTK)**: NLTK is a leading platform for building Python programs to work with human language data. It provides easy-to-use interfaces to over 50 corpora and lexical resources such as WordNet, along with a suite of text processing libraries for classification, tokenization, stemming, tagging, parsing, and semantic reasoning, wrappers for industrial-strength NLP libraries, and an active discussion forum.

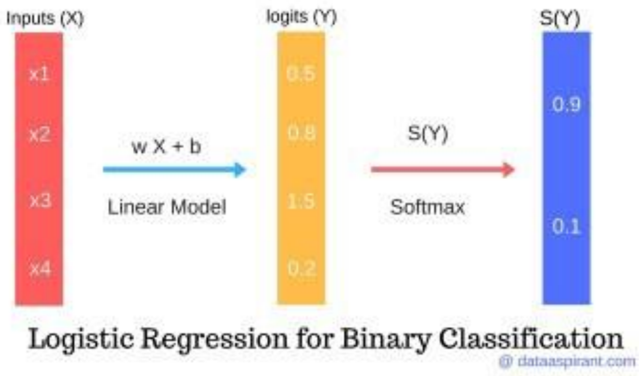
2. **Flask:** Flask is a lightweight WSGI web application framework. It is designed to make getting started quick and easy, with the ability to scale up to complex applications. It began as a simple wrapper around Werkzeug and Jinja and has become one of the most popular Python web application frameworks. Flask offers suggestions, but doesn't enforce any dependencies or project layout. It is up to the developer to choose the tools and libraries they want to use. There are many extensions provided by the community that make adding new functionality easy.

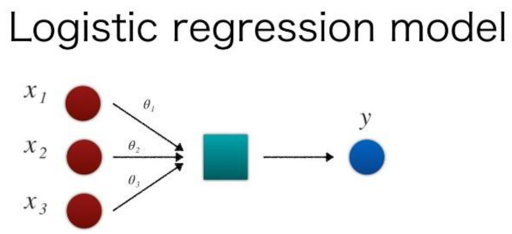
3. **Google Web Search API:** The Google Custom Search Engine API is a RESTful API that allows developers to get web or image search results data in JSON or Atom format. With the API, developers can add web search and/or site search capabilities to their website, blog or collection of websites.

4. **Word Cloud:** Word clouds (also known as text clouds or tag clouds) work in a simple way: the more a specific word appears in a source of textual data (such as a speech, blog post, or database), the bigger and bolder it appears in the word cloud. A word cloud is a collection, or cluster, of words depicted in different sizes. The bigger and bolder the word appears, the more often it's mentioned within a given text and the more important it is. Also known as tag clouds or text clouds, these are ideal ways to pull out the most pertinent parts of textual data, from blog posts to databases. They can also help business users compare and contrast two different pieces of text to find the wording similarities between the two.

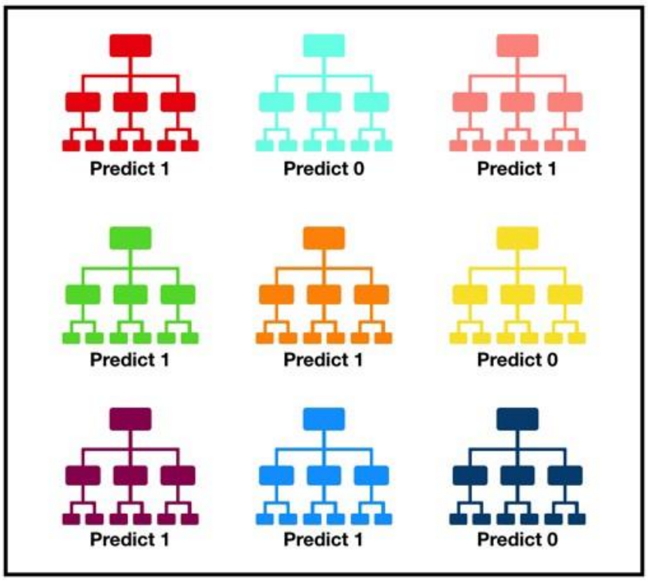
## 4. ALGORITHM USED:

**Logistic Regression:** Logistic regression is a statistical method for analysing a dataset in which there are one or more independent variables that determine an outcome. The outcome is measured with a dichotomous variable (in which there are only two possible outcomes). It is used to predict a binary outcome (1 / 0, Yes / No, True / False) given a set of independent variables. To represent binary / categorical outcome, we use dummy variables. You can also think of logistic regression as a special case of linear regression when the outcome variable is categorical, where we are using log of odds as dependent variable. In simple words, it predicts the probability of occurrence of an event by fitting data to a logit function.




**The Random Forest Classifier:** Random forest, like its name implies, consists of a large number of individual decision trees that operate as an ensemble. Each individual tree in the random forest spits out a class prediction and the class with the most votes becomes our model's prediction (see figure below).



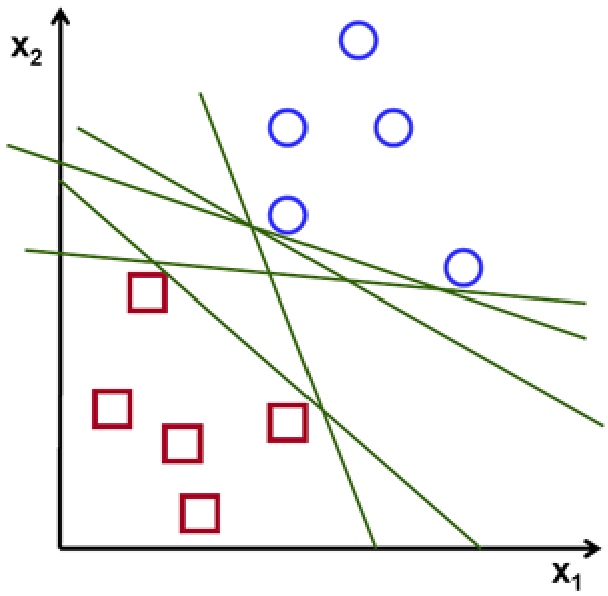

Tally: Six 1s and Three 0s
**Prediction: 1**

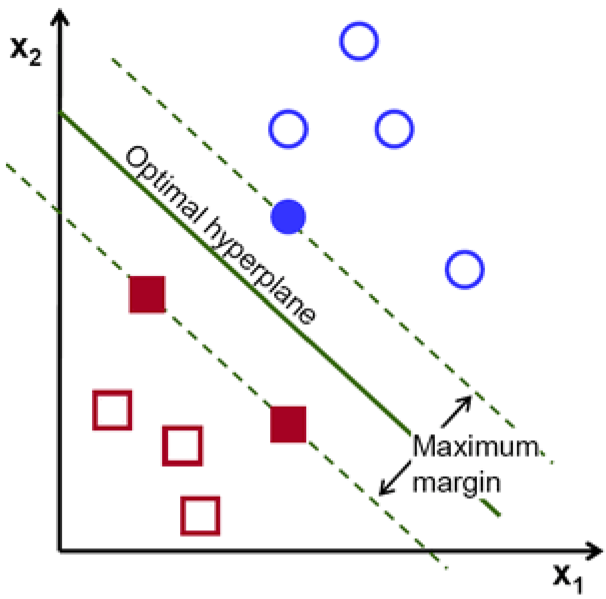
A large number of relatively uncorrelated models (trees) operating as a committee will outperform any of the individual constituent models.The prerequisites for random forest to perform well are:

1. There needs to be some actual signal in our features so that models built using those features do better than random guessing.

2. The predictions (and therefore the errors) made by the individual trees need to have low correlations with each other.

**Support Vector Machine:** The objective of the support vector machine algorithm is to find a hyperplane in an N-dimensional space(N- the number of features)that distincltly classifies the data points.



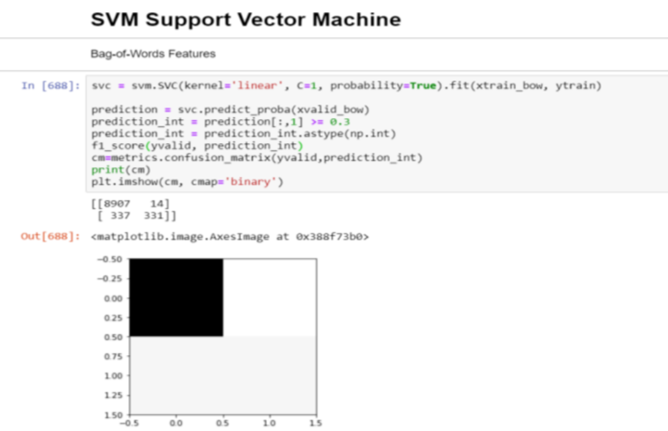




To separate the two classes of data points, there are many possible hyperplanes that could be chosen. Our objective is to find a plane that has the maximum margin, i.e the maximum distance between data points of both classes. Maximizing the margin distance provides some reinforcement so that future data points can be classified with more confidence.

## 5. EXPERIMENTAL RESULTS

A set of experiments carried out on stress analysis data obtained from twitter on the social media users. The performance evaluation of the system is performing using this dataset. The screenshots of various phases of stress analysis system are as follows:

### Fig-2 represents the login page of stress analysis system.




## 6. CONCLUSION

The aim of the project is to allow users to identify and detect whether they are depressed or not by the activities occurring in their lives and the tweets/comments can be analyzed very easefully. In the proposed system architecture we can detect user are in stress or not due to interactions on social network like Tweets. This Project uses technologies like Python, Flask, Wordcloud, Natural Language Toolkit and Google Web Search API. According to existing research works, long-term stress has been found to be related to many diseases, e.g., clinical depressions, insomnia etc. Moreover, suicide has become the top cause of death among Indian 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. Thus, there is significant importance to detect stress before it turns into severe problems.

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