Detecting Depression from Tweeter Data Using Bayes Algorithm

Rutika Parkhe 1, Shruti Jagdale 2, Suraj Borkar 3, Prof. Madhavi Kulkarni4
U.G. Student, Department of Computer Engineering, JSPM’S BSIOTR, Wagholi, Pune, India1,2,3
Associate Professor, Department of Computer Engineering, JSPM’S BSIOTR, Wagholi, Pune, India4

ABSTRACT: Depression is the driving cause of incapacity around the world. Nearly 75% of individuals with mental clutters stay untreated in developing nations with nearly 1 million individuals taking their lives each year. In expansion, agreeing to the World Health Organization (WHO), 1 in 13 universally endures from anxiety. The WHO reports that anxiety clutters are the foremost common mental disorders around the world with particular phobia, major depressive clutter and social phobia being the foremost common anxiety disarranges. Depression on Social Media, It has been found out in a overview that 322 million individuals around the world live with depression. Recognizing prior depression can be a tremendous step to address the mental sickness and offer support to the individuals enduring from this terrible mental illness.

KEYWORDS: Sentiment Analysis , Bayes theorem ,Machine Learning, Depression Detection

I. INTRODUCTION

Agreeing to Our World in Information Site, Depressive clutters happen with changing severity. The WHO’s International Classification of Illnesses (ICD-10) characterize this set of clutters ranging from mild to moderate to severe. The Institute for Health Measurements and Evaluation (IHME) receive such definitions by disaggregating to gentle, persistent depression (dysthymia) and major depressive clutter (extreme).

All forms of depressive clutter encounter a few of the following symptoms:

(a) Diminished concentration and attention
(b) Diminished self-esteem and self-confidence
(c) Thoughts of blame and unworthiness (indeed in a mild sort of episode)
(d) Disheartening and critical views of the future
(e) Thoughts or acts of self-harm or suicide
(f) Aggravated sleep
(g) Reduced appetite

Paper is organized as follows. Segment II portrays the diverse way of actualizing the Depression Detection model Utilizing Artificial Intelligence. How We are able to execute the Bayes algorithm in Machine Learning to Distinguish the Depression from the Tweets, that's given in Segment III. Segment IV presents experimental results showing results of, Processed data. At last, Segment V presents conclusion and the future Scope.

II. RELATED WORK

In 1895, the German therapist Emil Kraepelin got to be the primary to recognize hyper depression, what we presently known as bipolar clutter, as an sickness isolated from dementia praecox (the term for schizophrenia at the time). [1]. The concept of Identifying the depression utilizing Artificial Intelligence was first represented in 19th and 20th century. It was 19th Century German therapist Emil Kraepelin who started alluding to different forms of depression as “depressive states,” due to the low disposition that characterizes it. Kraepelin moreover took a double approach to mental illness, separating depression into two categories: hyper depression and dementia praecox. Melancholics were in like manner seen as thoughtful, deep masterminds, who ordinarily related more to theadder portion of the enthusiastic range. It is from this discernment of despondency that our current concept of sadness inevitably advanced. [2]. Kraepelin’s refinement was based on whether the depression’s source was outside or inside: in case the depression was
caused by an outside tragedy, such as the passing of a cherished one, it was considered a form of hyper depression and anticipated to be long winded and passing. Assist researches within the field of detecting depression appears that, nowadays social network like tweeter or any other social platforms where people are free to precise their sentiments may be the best asset for identifying the depression. The method is advance named as early depression detection process. In spite of the fact that therapeutic data, Person’s connections with others are very much ingenious but in the period of social networking these platforms are truly accommodating and can be effectively utilized for the depression detection[3]. In this strategy people’s posts, tweets, etc. Are handled using different machine learning or deep learning algorithms, and after that yield is given within the frame of medical reports or messages, etc [4]. In a work (Choudhury et al., 2013 a, Choudhury et al., 2013 b) creators utilized crowd sourcing to gather information of Twitter clients with clinical depression and degree behavioral qualities to construct a classifier in order to recognize depression in an individual. In another consider the creators utilized Facebook information and created a arrangement of measurable models to anticipate postpartum depression. Authors (Rensik et al., 2015) investigated the use of administered theme models within the analysis of etymological signal for detecting depression in Twitter[5]. Recently deep learning methods have too been utilized for depression detection on social media. Creators used profound neural systems on Twitter information for detection of depression among Twitter users. (Trotzek et al., 2018) compared their convolution neural network-based model on distinctive word embeddings to a classification based on user-level phonetic metadata. Finally, an gathering of both approaches is appeared to attain state-of-the-art results in a depression detection task[6].

III. METHODOLOGY

Bayes Theorem is a approach to decide conditional probabilities – that's, the probability of one occasion happening given that another occasion has as of now happened. Since a conditional probability incorporates extra conditions – in other words, more data – it can contribute to more exact results.

The Bayes Theorem states that:

\[
P(H | X) = \frac{P(X | H) * P(H)}{P(X)}
\]

1. Evidence:- P(X) is known as evidence.
2. Prior Likelihood:- P(H), known as the earlier probability, is the basic likelihood of our hypothesis.
3. Posterior Probability:- P(H | X) is known as the back probability.
4. Likelihood:- P(X | H) is the probability.

In Bayes Hypothesis it give results comparable to other algorithms, and Bayesian classifiers are for the most part considered basic high-accuracy strategies. However, care ought to be taken to keep in mind that Bayesian classifiers are especially appropriate where the assumption of class-conditional independence is substantial, and not across all cases. Another practical concern is that securing all the probability data may not continuously be feasible. Applying this family of algorithms in machine learning includes familiarity with terms such as earlier probability and back probability.

Fig 1: Data flow in Bayes Algorithm
IV. EXPERIMENTAL RESULTS

In this Demonstration there are Estimation (8,000 positive tweets), and another one for depressive tweets (2,314 tweets), with a add up to of 10,314 tweets. The Sentiment 140 dataset contains 1,600,000 tweets extricated utilizing the twitter API. The tweets have been commented on (0 = negative, 2 = unbiased, 4 = positive) and they can be utilized to distinguish sentiment. It contains the taking after 6 fields: target: the extremity of the tweet (0 = negative, 2 = impartial, 4 = positive) ids: The id of the tweet (2087) date: the date of the tweet (Sun May 1 7 22:18:36 UTC 2010) flag: The query (lyx). In case there's no query, at that point this esteem is NO_QUERY.

user: the client that tweeted text: the content of the tweet

![Image of sample keywords used in positive tweets](A) ![Image of sample keywords used in negative tweets](B)

Fig 2: sample keywords used in positive tweets(A), sample keywords used in negative tweets(B)

<table>
<thead>
<tr>
<th>id</th>
<th>message</th>
<th>label</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>106</td>
<td>just had a real good moment. i missssssssssssss hi...</td>
</tr>
<tr>
<td>1</td>
<td>217</td>
<td>is reading manga. <a href="http://plork.com/p/nepTe">http://plork.com/p/nepTe</a></td>
</tr>
<tr>
<td>2</td>
<td>229</td>
<td>@comaganjeh <a href="http://twipic.com/2y2zs">http://twipic.com/2y2zs</a> - http.</td>
</tr>
<tr>
<td>3</td>
<td>288</td>
<td>@soapcal need to send 'em to my accountant tomo...</td>
</tr>
<tr>
<td>4</td>
<td>540</td>
<td>ADD ME ON MYSPACE! myspace.com/LookThruMe</td>
</tr>
<tr>
<td>5</td>
<td>624</td>
<td>too sleepy. good times tonight though</td>
</tr>
<tr>
<td>6</td>
<td>701</td>
<td>@SilkCharm re: limit as someone already said, d...</td>
</tr>
<tr>
<td>7</td>
<td>708</td>
<td>23 or 24 or 25 possible today. Nice</td>
</tr>
<tr>
<td>8</td>
<td>1193</td>
<td>nite tonight workout in the am -ciao</td>
</tr>
<tr>
<td>9</td>
<td>1324</td>
<td>@daNamour Night, darling? Sweet dreams to you</td>
</tr>
<tr>
<td>10</td>
<td>1332</td>
<td>Good morning everybody!</td>
</tr>
<tr>
<td>11</td>
<td>1368</td>
<td>Finally I just created my WordPress Blog. The...</td>
</tr>
<tr>
<td>12</td>
<td>1578</td>
<td>kisha they can get over u til they get out fmm...</td>
</tr>
<tr>
<td>13</td>
<td>1595</td>
<td>@nicolichie Yes I remember that band. It was...</td>
</tr>
<tr>
<td>14</td>
<td>1901</td>
<td>I really love reflections and shadows</td>
</tr>
<tr>
<td>15</td>
<td>1899</td>
<td>@bluezero oo it's fantasy? i like fantasy no...</td>
</tr>
<tr>
<td>16</td>
<td>1899</td>
<td>@nicolichie28 no proa, i sell nothing other than...</td>
</tr>
<tr>
<td>17</td>
<td>1919</td>
<td>@shipeaker &quot;NOKIA connecting people&quot;</td>
</tr>
<tr>
<td>18</td>
<td>1992</td>
<td>One again stayed up to late and have to start...</td>
</tr>
<tr>
<td>19</td>
<td>2097</td>
<td>@Kai_Penn I just read about your new job. CONG...</td>
</tr>
</tbody>
</table>

Fig. 3. Sample tweets (Data Format)(A)
Whenever we process the data and execute the Bayes algorithm it will process the data and gave us the output in the above format. If the model detects the negative wordings in tweets it will give the result as True otherwise it will give output as false.

V. CONCLUSION

Social media has revolutionized the way we connected with the world, permitting us all to remain associated and self-expressive. Blended anxiety depression and social media appear to exist in a horrendous cycle with one issue frequently invigorates the other. We have implemented an Depression Detection Model utilizing the tweeter data using Bayes algorithm in Machine Learning Technology. It has given one of perfect way for early Detection of the Depression among the individuals. About 85% expectations are found to be precise in the preliminary analysis.

As a conceivable future work, fine grain feeling analysis can be done to detect anxiety markers rather than utilizing Senti Word Net which categorizes the words into three polarities. Advance, the model can be tried on distinctive client base: geographic, age, calling etc. Neuro-fuzzy and profound learning models can be explored for superlative forecast performance.

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Impact Factor:
7.512

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