Mini Project

Analysing Depression from Users' Social Network Footprint

Mid Term Report MP10

Team Members

- Prajneya Kumar
- Nikhil Chandak
- Arvindh A
- Shri Vidhatri M M

1 Introduction

1. The clinical definition of depression is an "emotional state with retardation of psycho-motor and thought processes, a depressive emotional reaction, feelings of guilt or criticism and delusions of unworthiness"
2. Depression is commonly construed as a reaction to negative environmental circumstances such as the experience of undesirable, negative life events, Gender differences and stereotypes, Chronic Stress, Low socioeconomic position, Exposure to Early Adversity and/or Stressful parenting circumstances, and other factors like marital discord, intimate partner violence, parenting difficulties, insecure attachment, and low social support.
3. Depressed states evolve to minimize risk in social interactions

2 Motivation

1. The psychiatrically diagnosed depressed patients showed a small (21 %) elevation in the risk of developing cancer of all sites combined and the same was noted for the predominant diagnosis, depressive neurosis
2. The students who have symptoms of anxiety and/or depression or have been diagnosed are struggling academically because of maladaptive coping.and some repercussions of this are failing or withdrawing from courses, academic probation, academic suspension, or withdrawal from the university.
3. Economy, Academic status and the health status of a country are affected by psychological disorders, especially depression and needs to be addressed before the issue goes out of hand and results in high number of fatalities.
4. 300 million people worldwide are suffering from depression.When it comes to countries.
5. India is the most depressed country in the world, according to the World Health Organisation, followed by China and the USA.
6. The average suicide rate in India is 10.9 for every lakh people and the majority of people who commit suicide are below 44 years of age.

3 Literature Review

1. Detecting Depression Through Tweets by Diveesh Singh and Aileen Wang: Implementation of four models based on RNNs and CNNs using LSTM and GRU that help in detecting depression using tweets as a dataset.
2. Predicting Anxiety, Depression and Stress in Modern Life using Machine Learning Algorithms by Anu Priyaa, Shruti Garga,*, Neha Prerna Tigga: Analysis of five major machine learning algorithms in the detectrion of depression, namely, Decision Tree, Random Forest Tree, Naive Bayes, SVM and KNN
3. Deep learning in mental health outcome research: a scoping review: Review of DL Techniques that have been applied in the field of mental health such as DFNN, RNN, CNN and Autoencoders, especially in social media data.

4 Future Work

Following problems need to be looked at and has been missed out in most of the existing research:

1. No way to find out "true positives" and "true negatives" since social media data is typically deidentified
2. Textual and image data is analysed, that is, social data is analysed, but the social network of a user is not analysed
3. Lack of real-time interventions
4. Traceable Depth: Doctors most of the times need to know about the factors or parameters that led to the final prediction

5 Features to work on

Following features seem to be a good measure of the field after reading extensive literature

1. Identifying Depressive symptoms using evidence keywords taken from a lexicon of nine groups of depressive symptoms in Diagnostic and Statistical Manual of Mental Disorders (DSM-V)
2. Analyse the sentiment of the posts as depressed people tend to have negative polarity in their posts
3. Identifying Ruminative thinking patterns as depressed people tend to have repetitive thoughts
4. Looking at the POS (Part of Speech) level in their writings as their writing style tends to contain a different distribution of nouns, verbs and adverbs and the complexity of sentences (Gkotsis et al., 2016)
5. Highly clustered egonetworks is also a determinant of a person's mental state (Gamon et al., 2013)
6. Metadata like location can also be an important factor in the analysis as certain places could be associated with higher concentration of depressed individual (link)
7. People who go through the same experiences in day to day life tend to have similar outlook of the world, so exploring the friend network of a depressed individual could unlock more potential research
8. Lastly, the amount of posts and the temporal analysis of the activeness of an individual could be a key measures as well, as the activity tend to drop a lot or shoot up a lot seeking attention if one falls into depression