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JSS Mahavidyapeetha

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JSS SCIENCE AND TECHNOLOGY UNIVERSITY MYSURU

SYNOPSIS FOR THE FINAL YEAR PROJECT

Title of the Project

"Deep Learning based detection of Depression"

Under the guidance of

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Project Team No: 1

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1 PROBLEM STATEMENT

A widespread psychiatric illness is depression. It has a direct and indirect effect on economic development. Not only for those affected, but also for their families and their social and work-related environments, depression also has significant consequences [6]. It can be the psycho-physiological basis for symptoms of panic and anxiety. Increasingly, panic disorder has been focused on health care and the media, impacting young people aged 20-40. Social media is increasingly used by different levels of age group. Patients of psychiatric disorders also turn to online social media and web forums for specific conditions and emotional support information [7,8]. Although social media can be used to transform the life of an individual as a really beneficial tool, it can create certain conflicts that can have a negative effect. The practices turn out to be extremely difficult with the growing number of users and their content. This motivates for detecting depression from the user posts. The main idea is to detect such psychological problems from user's posts as early as possible.

2 AIM

Deep Learning based detection of Depression.

3 OBJECTIVES

- The first step is to pre-process the data brought from text mining into form that is predictable and analyzable for depression detection.
- It is imperative for extracting features from the structured textual data for natural language processing.
- With large pool of features we have to generate models using different machine learning and deep learning techniques.
- To analyze and optimize the models for assessment for depressive symptoms of an individual.

4 REVIEW OF LITERATURE

According to DEY, SHARMISTHA, et. al., [1] more than 264 million people across globe suffer from mental health conditions and depression, between 76% to 85% of lower and middle-income group don't receive any treatment for depression. The author also mentions that since the dawn of the beginning of the internet people have begun to dump their thoughts on the Internet which may prove to be a very powerful tool for the diagnosis of a person's mental health problems.

They [1],[2],[3] have given a survey on various algorithms applied on depressions data which includes Machine Learning, Deep Learning, Data Mining etc. also mentioned about various trends in the usage of Random Forest, Hidden Markov Model, Naïve Bayes models for the better analysis of the model.

Mandar Deshpande, Vignesh Rao [2] have proposed a concrete idea on data extraction and data preprocessing using Natural Language Processing. The model proposed incorporates SVM, Multinomial Naïve Bayes as the primary algorithms. Author has taken into consideration F1-Score, Precision and Recall as the accuracy measures.

Md. Rafqul Islam et. al., [3] proposed a model which uses various Machine Learning Algorithms like KNN, SVM, Decision Tree and variations of it, the model has made use of Ensemble learning techniques to increase the performance and Accuracy of the model. There was also a special mention about the tool called LIWC which is used to extract relevant data from Social Media Sites. In the feature extraction step, there is a thorough analysis of characteristics of the data.

Hao Guoa et. al., [4] proposed a model on the basis of "Resting state functional brain networks" which has been widely studied in brain disease, Resting state functional brain networks were constructed for 38 major depressive disorders. The model has conceived an average accuracy of 79.27% and 78.22% for SVM and Neural Network with RBF kernel respectively, with 28 features.

5 RESEARCH METHODOLOGY

According to WHO over 300 million people suffer from depression, this disorder significantly affect self-confidence, social relations which will lead to physical and mental health problems impacting negatively on patient and his/her family.

Now a day's people tend to express their feelings on social media to show whether they are happy, sad or depressed thus, we can know about their state of mind by these digital/social interactions, we can collect these interactions as data in the form of words/text.

We collect this data by scrapping the web and data mining, the raw text data collected from web/social media is pre-processed such that it can be used for analysis, we will use several pre-processing techniques to clean data i.e., feature extraction, text pre-processing like tokenization, spelling correction, stemming and lemmatizing.

The pre-processed/cleaned data then passed through several ML and DL models to analyze the data and to get results/words which express the depression and the main reasons which caused the depression, or reasons which may lead lot of people into depression.

The aim of this project is to find ways to use automatic analysis of text to create predictive models that reliably detect persons at risk of depression or show symptoms of depression, and to predict number of people will be in depression in near future, This knowledge can be shared with organizations which can provide help to these people as early as possible and other organizations which can take precautions to keep people away from depression.

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