Finding User's 'Happiness Factor' by Analyzing Posts on Social Media for Mental Health Support

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The project focuses on assessing the degree of depression of a user by finding their 'Happiness Factor' (HF) based on their posts across a social media platform. This HF will help in providing them with help and support for mental health.

'Happiness Factor' refers to an unbiased and confidential rating of the depression level of each social media user. HF will help an Online Social Network (OSN) provider take necessary steps (such as providing mental health resources, posting happy quotes, sharing old happy memories with friends) to improve the user's state of mind.

With the increasing accessibility of the internet, online social networks have seen an inflation in the number of users. They tend to express themselves through tweets, posts, and the usage of hashtags, by means of which an overview of the user's thought process can be obtained[1]. Using social media as an outlet for emotions is very common and is more relevant after the COVID-19 outbreak.[2]. It is studied that the ways in which a person expresses are an insight into their sentiments[3, 4]. People have been using social media to discuss and communicate their feelings, post about their daily activities, share information with friends, and more so during this pandemic wherein the whole world went into a state of lockdown.[5]

Exposure to social media has always been stigmatized and associated with the deterioration of mental health[6]. However, it can effectively be used as an antidote for itself[7]. Concerns about mental health is very common, but people are also hesitant to seek help and talk about it face-to-face[8]. However, on a social media platform, where their true identity is hidden, they can connect with their online friends to discuss the same without fear of judgement[9].

Through this project, we want to portray the usage of social media platforms as a mental health awareness resource. This project is divided into three phases. The first social media platform being explored is Twitter. For Phase I, multiple datasets comprising tweets from different users and their corresponding labels are pre-processed and used to train various Machine Learning(ML) and Deep Learning(DL) models to classify the tweets as 'Depressed' or 'Not Depressed'. Currently, work is being done using the Multinomial Naive Bayes model, and accuracy of 75%-80% has been achieved on the datasets with 10,313 and 10,48,534 tweets, respectively. More ML models (Support Vector Machines, Decision Trees, Random Forest) and DL models (Long Short-Term Memory (LSTM) and Bi-directional LSTM) will be explored to get better accuracy, and the best model will be used to label the tweets of a user and used to find the HF of that specific user.[10] Phase II will focus on scraping Twitter using Tweepy, an open-source Python package that gives access to the Twitter API to obtain the tweets. Phase III will analyze the tweets to calculate the HF for a user by calculating the probability of depressed posts user tweets compared to the total number of posts they tweet in a given period.

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