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Depression Detection using NLP Algorithm on YouTube Data

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Abstract - *Depression may be a common and high medical issue or problem that negatively affects how you are feeling, the way you think that, and the way you act. In India, the National Mental Health Survey 2015-16 reveals that almost 15 percent of Indian adults need active intervention for one or more psychological state issues and one in 20 Indians suffers from depression. This survey motives us to work thereon. Its approximate shows that in 2012, India had over 258,000 suicides, with the age-limit of 15-49 years being most pompous. This age bracket spends the foremost time with social media and shares their view on it. By using this we will provide a solution to detect the Depression state of the user and supply social support to the user. To scale back the percentage of death due to depression the system is going to be beneficial. It'll provide social support to users by automatically detecting depression. This technique will use the emotions of the user recognized from videos watched by the user. The title of the video describes the content or category of the video with help of this we will find the mood and depression state of the user to expelled out from depression.*

***Key Words*: YouTube Sentiment Analysis, Natural Language Processing, Depression Level, API, Social Media, Machine Learning**

1. RELATED WORK

Over a previous couple of years, social media has been wont to examine psychological health by many researchers considered that social media principal can divert the users' personal life on many levels. They proposed to acquire supervised machine learning approaches like deep neural networks. Their primary objective was to detect depression using the foremost effective deep neural architecture from two of the foremost popular deep learning approaches within the field of natural language processing (NLP): Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs), given the limited amount of unstructured data.

Some accessible research works affiliated with Machine and Deep Learning-based sentiment and emotion analyses are described.

1.1 Machine learning for emotion analysis

A Machine Learning-based human emotion examination approach is represented by Riyadh. During this research work, the authors use sadness, happiness, disgust, and surprise for his or her distributed task. They collected tweets from Sentiment140, labeled them manually, abolish tweets with no emotion, and created a balanced dataset accommodate 3,750 tweets. 3,500 tweets were selected because of their training dataset and 250 tweets as the testing dataset. For feature extraction, the Unigram model and therefore the Unigram model with POS tagging were used. The authors use the frequency of the Bag of Words model as a feature to coach their classifier.

1.2 RNN for Depression Forecasting

A novel approach for depression forecasting was initiate by Suhara, using RNN. The authors design the LSTM-RNN based deep learning algorithm. They used their model to elaborate embedding layers regarding every absolute parameter, which also assimilate a day-of-the-week variable to work out the day-of-the-week consequences in their imitation. They collected depressing data from 2,382 self-declared depressed persons, covering 22 months time span, via an android application. Their technology was successfully ready to forecast 84.6%, 82.1%, and 80.0% severe depression instances in 1, 3, and 7 days beforehand, respectively.

1.3 Machine Learning for Depression Analysis

Wang et al. conducted an investigation on Sina microblog, a Chinese micro-blog, which is one among the foremost influential social media services in China. They integrate both Psychological and Machine Learning knowledge for their evaluation. From the technical perspective, Machine Learning techniques, like Decision Tree, Naive Bayes, and Rule-based classifiers were used. Their described method contained mainly three types, namely, polarity calculation of sub-sentences, sentence and word segmentation, and polarity calculation of sentences. Their model was ready to achieve 80% precision.

2. GOAL AND OBJECTIVE:

We have presented a comprehensive computational framework for depression detection from video emotion based on video title analysis The system gather information from social media use and processing on it collectively and identify the emotions behind social active

content, through the emotions obtained from processing we can easily detect the mood of user as user is happy or user is in depression.by providing social support to user we can easily expelled user from depression Our results show that a higher predictive performance is hidden in proper features selection and their multiple feature combinations.

3. PROPOSED SYSTEM

Our proposed system for detection of depression and provide social support is developed for the users who are suffering from depression but due to lack of support sometimes they lost their life. In the proposed system, we provide a social platform that helps the user to expelled out from it. In our proposed system we use social media platforms like YouTube for the detection of depression as we know that mobile users are more connected with social media with the help of things we used in our project. In the existing system, depression is detected in various ways such as from facial expressions, visual-audio features, etc. Through the proposed system, it detects the mental condition or mood of the user during the use of social media such as YouTube. We would be getting YouTube videos via YouTube Official API and then we manually would assign a Depression Factor to that video. Depression Factor of Video and official video link would be saved in our database.

The proposed methodology is shown in fig. 1: Proposed system architecture.

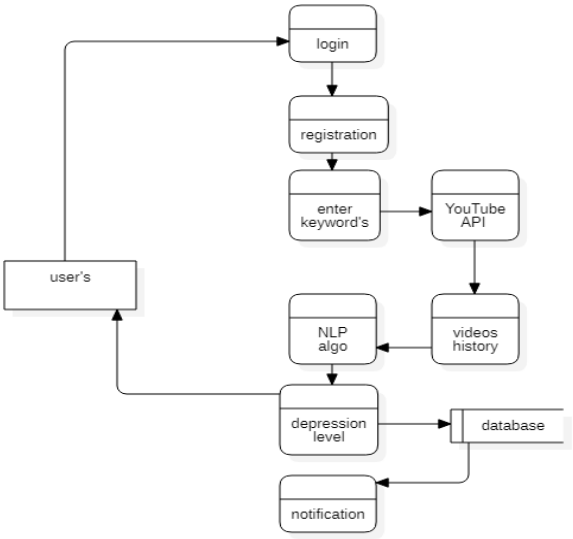

Fig. 1: Proposed system architecture.

A user would Registration/login through an Android application and search keywords as per there mental condition to check videos on YouTube. YouTube API show relevant result as per client keywords. User can watch the video or check for another keywords. On the basis of search keywords and watch video history will be generated and on the history details depression will be calculated using Natural Langugae Processing (NLP). For better experience we use flutter technology for the programming to give user attractive GUI.

Natural language processing (NLP):

Natural language processing (NLP) techniques are often used to make reasoning about peoples' mental states from what they write on YouTube, Facebook, Twitter, and other social media sites. These reasoning can then be wont to create online track to direct people to health information and endorsement and also to get personalized arbitration. Regrettably, the computational methods used to collect, process, and utilize online writing data, also because the gauging of those system, are still dispersed within the literature. This internship provides a taxonomy of knowledge sources and system that are used for psychological state support and intercession. Specifically, we review how social media and other data sources are wont to detect emotions and identify people that could also be in need of psychological assistance; the computational techniques utilized in labeling and diagnosis; and eventually, we discuss ways to get and personalize psychological state interventions. The overarching aim of this scoping review is to spotlight areas of research where NLP has been applied within the psychological state literature and to assist develop a standard language that pulls together the fields of psychological state, human-computer interaction, and NLP.

Mathematical Formulation:

1) Input keywords

$I = \{i_1, i_2, i_3 \ldots\ldots i_n\}$
Where I is the input string
$i_1, i_2, i_3 \ldots\ldots i_n$ are the words of string

2) Identify depression

D = {d1,d2, d3……dn}

Where, "D" is the depression

3) Identify depression level

l = {l1, l2, l3……ln}

Where, "L" is main set of depression level

4) Identify features

V= {v1, v2, v3……vn}

Where, "V" is main set of watch video

Classification sentiment of L :

If l1 ϵ ∑v1, v2…..vn

V ← l1

.

.

.

If ln ϵ ∑v1, v2…..vn

V ← ln

Where,

l1,l2…ln = extracted feature (depression level)

V = classification of watch video and keywords

4. CONCLUSION

In this research, we established a NLP based depression detection technique by analyzing video search data collected from YouTube. It's been exhibit that depression can lead a private to severe mental disease, even to the trail of suicide and also how a machine learning approach can detect depression of social media users. Micro-blogging social networking sites such as: YouTube, twitter and facebook provide users to precise their day to day thoughts and activities which reflect users' behavioral attributes and personality traits. In internship program we proposed that depression detection on the basis of title or keywords search by user on our application. For video's we use YouTube API to show related video on application, to detect depression NLP algorithm is used. On the collected history data as to show user as depressed or non-depressed.

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