

## International Journal of Innovative Research in Science, Engineering and Technology

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# A Machine Learning Approach for Psychological Disorder Detection Using Voice Command

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**ABSTRACT:** Mental disorder leads to complications in professional, educational, social as well as marital relations. Inability to distinguish mental disarranges denies powerful treatment for patients. The reason for this investigation was to exhibit doctors to evaluate the commonness as well as nature of mental issue. Beside these lines, the fundamental reason for our undertakings is to investigate the indications of people and to apply contradiction to the circumstance to recognize the disordered individual. In our venture, information will be given as discourse. Discourse will be changed over into content utilizing Google APIs Then by executing the NLP in the content, the individual will be examined in the feeling of utilizing BDI questions. With that response that the individual is ordinary or in a pitiful state. In the event that the subsequent outcomes are antagonistic, that individual is observed to be in a condition of detection; at that point we will propose a few hints for the individual to leave that state. The prescribed cure might be to visit a specialist, do practice or get things done of intrigue. The result generated will be stored. From that response whether the person is normal or in depressed state is find out. If the result generated are negative that is the person is found in depresses state, then we will suggest that person some measures to come out that state. The measure suggested can be like visiting a physician, doing exercise or doing things of interest.

**KEYWORDS:** Beck Depression Inventory (BDI), Natural Language Processing, Depression, Machine Learning.

## I. INTRODUCTION

Speech is most used form of communication between humans. There are numerous spoken languages which are used throughout the world. The communication among the human being is mostly done by though the voice, therefore it is natural for people to expect speech interfaces with computer. Emotion is the one type of effect, other types of mood, temperament and sensation. It has been widely studied in psychology and behavioral science, as they are a very significant component of human behavior. Now days they have also fascinated the attention of researchers of computer science, especially in the field of human computer interactions. Advancement in the text analysis has allowed the field of finding the emotion to develop a current interest in computational linguistics. Detection of emotion is the most recent technique of reader analysis and therefore, there are weak standard methods in it. Emotions can be expressed in terms of happiness, sadness, anger, hatred, fear, surprise as well as so forth. While the board subject of emotion in psychology has been studied for decades, little effort has been made in the effort to detect emotions from the lesson. In this work, we believe that the emotional response of an input sentence is essentially represented by its word presence. This work we proposed a system for psychological disordered detection using users voice command. In this user answer the question by selecting option. Using the sentiment analysis algorithm we analyze the behavior of particular person using the voice input.

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## II. LITERATURE SURVEY

According to Karen L. Smarr et al [1] Self-report summarizes adult remedies, which are measured to be the most relevant to evaluate depression in the circumstance of rheumatology, clinical and / or research practice. This portion signifies an update of the article of special issue which appeared in arthritic care and research in 2003; The present analysis followed the same selection criteria to include assessment tools. In particular, measures were selected on the basis of several ideas, including administration, interpretation and adoption by arthritic health professionals from various background and training approaches; Self-report measures providing data from the patient or research participant's point of view; Availability of adequate psychometric literature and data associated to the Rheumatology population; Continuous use in both clinical and research practice with adult rheumatoid population. This revision was not envisioned to be complete.

According to Shefali S. Verma et al [2] For the evaluation of the proposed collective facility selection approach, demonstrate it by organizing two different simulation analysis. In this study, we were able to demonstrate that by selecting a variable using a collective feature selection approach, more often than the actual positive epistemic variables of implementing any single technique for facilitating selection through simulation studies can help in choosing. We were able to validate the efficiency of the collective feature selection in comparison with many simulations in our simulation.

According to Prathamesh Raut et al [3] mood of human beings is something that defines the inherent emotions of a person. Detection of mood is precise significant in such cases. For the detection, some android applications are being designed so that using the speech signals mood

of a person is determined. Texts, speech inputs, facial expressions are considered. Then depending on the result doctors or the experts examine the type of mood whether happy, depressed or sad. BDI scores are then calculated and found what the type of mood is. Depression is a global growing cause for concern and is a major contributor in terms of total years lost due to disability. This sorts it easy to determine type of mood. Depression is one of the greatest dominant disorders, typically associated with negative emotions, such as sadness and helplessness.

According to Miss.Amruta G. Daundkar Miss. Sayali S. Fadale et al [4] Mental disorders cause problems in business, educational, social as well as marital relations. The goal of this work is to present therapists to the spread of mental disorders and to evaluate nature. Failure to identify mental disorders, patients are denied effective treatment. That is why, our project's most important purpose is to analyze the symptoms of individuals and to disperse the situation to find disorganized people. Speech will be given as input in our project. NLP language in the speech will be transformed into text using Google APIs, the analysis of that person will mean BDI questions.

According to Hanshu Cai et al [5] Depression is a major health concern in millions of individuals. Thus, Diagnosing depression in early stages is critical for the treatment in order to save the life of a patient. However, the current methods of detecting depression are human-intensive, as well as their outcomes depend on the knowledge of the doctor. Therefore, a comprehensive and purposeful way of identifying or even screening will be useful. According to the current study international 10-20 system, selects FV1, Fp2 as well as Fpz for electrode sites, which searches for a new method of detecting depression using the extensive prefrontal-lobe three electrode EEG system.

According to Yuan-Pang Wang et al [6] Major depressive disorder is more prevalent in patients with chronic medical conditions. Symptoms of depression can occur with severe medical illnesses such as heart disease, stroke, cancer, neurological disease, HIV infection and diabetes (1-3). The functional impairment associated with medical illnesses often causes depression. Patients those who present depression with medical ailments have more serious symptoms, they have more difficulty adjusting their health status, and more medical costs than those patients who do not have co-existing depression.

According to Yi Yang et al. [7] proposed whether the class labels of training data are available, feature selection algorithms can be roughly grouped into two families, i.e., supervised feature selection and unsupervised feature

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selection. Usually speaking, supervised Feature selection generally gives a better as well as more trustworthy performance, mainly due to the use of class labels. It is probable for supervised algorithms to train the proper feature selection tasks, considering the data labeled enough labels. However, labeling a large number of training data is tedious as well as time-consuming. In numerous real-world applications, the performance of existing feature selection algorithms is usually controlled by the accuracy of label training data. Therefore, it becomes a great research challenge to design a feature selection algorithm for those cases when only certain label data is available per action. Although multi-task classification and subspace learning.

According to Girish Chandrashekar et al. [8] system offer an summary of some of the methods present in literature. The objective is to provide a general introduction to variable eradication, Which can be applied to a wide range of machine learning problems. We focus on filters, casing and embedded methods. We also apply some feature selection techniques on standard datasets to demonstrate the applicability of feature selection techniques. Focus selection of the feature is to select a subset of variables that can efficiently describe the input data while reducing the effect of noise or irrelevant variables and still can provide good forecasts results. According to Cosmin Lazar et al [9] describes a universal conventional rule, these techniques are grouped in filters, wrappers, as well as embedded methods. Recently, a new set of methods has been added to the general structure of FS: clothing technology. Focus in this survey is on the filter feature selection methods for the exploration of informational facility in the Gene Expression Microarray (GEM) analysis, which is also identified as differentially expressed genes (DEG) discovery, gene priority or biomarker discovery.

According to Xiaowei Li et al [10] Depression has developed a chief health burden worldwide, as well as efficiently detection of such disorder is a huge challenge which needs latest technological tool, such as Electroencephalography (EEG). This EEG-based research attempts to find major frequency bands as well as brain areas that are associated to mild depression, as well as an ideal amalgamation of classification algorithms as well as methods of selection, which are used to detect future mild depression can be done.

## OBJECTIVES OF SYSTEM

The Objective of the proposed application is as follows:

- The goal of our project is to check the mentality of the person. And give the suggestion to the person to visit the physician.
- To implement a system using NLP based machine learning algorithms.
- Apply sentiment analysis approach using supervised learning.
- To evaluate the proposed system results with existing algorithms.

## III. PROPOSED METHODOLOGY

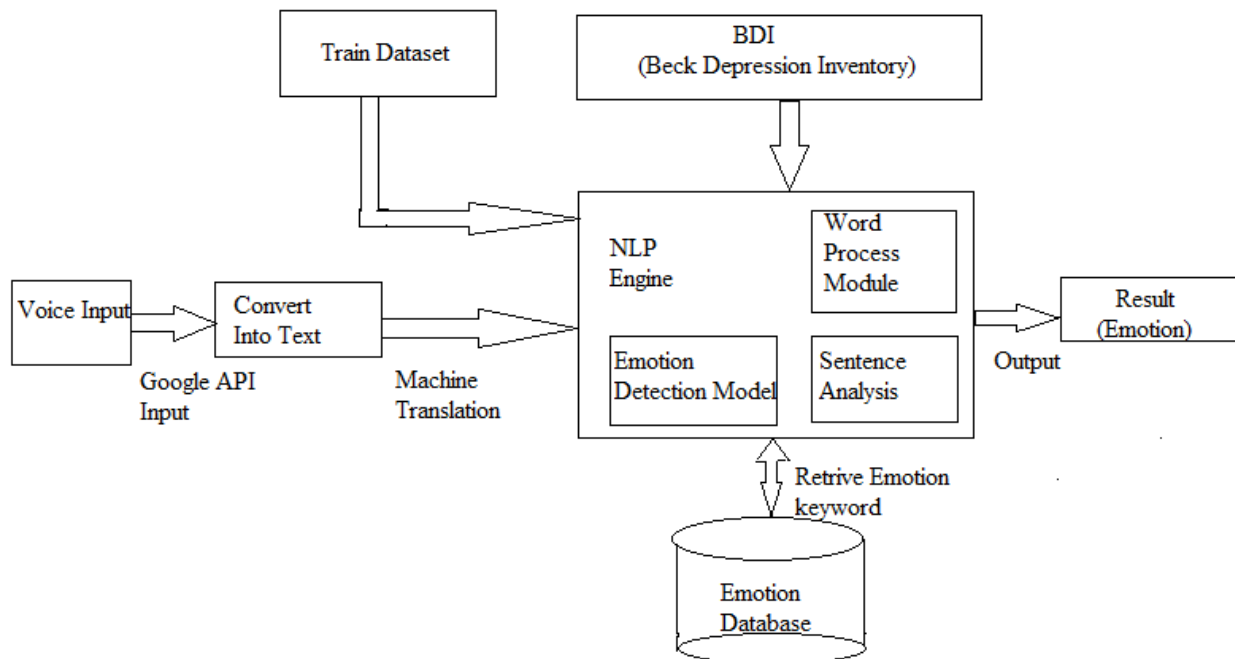
In this project the user will give the answer of question in the procedure of speech. This speech is converted into text using Google API. Then by applying NLP to text, sentiment analysis will do using BDI questions. The question is present on system the person answer that question this answer is store in the system. Using Google API this speech is converted into text. According that answer the person is in depression or normal state is show.

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**Figure 1 : Proposed System Architecture**

This system consist various processing modules, in first the Word-processing module Search for Keywords by Tokenization, Part-of-Speech Tagging, Negative Sentence and Positive Sentence. It enables us to find words of emotion with a given sentence. Ways to detect emotion use concepts and algorithms that are produced for the subject and sense analysis. In this sentence analysis module, our objective is to find the emotion with a sentence where there is no emotional keyword in the sentence. For this purpose, we analyze the sentences of different categories.

BDI stands for Beck Depression Inventory. Beck Depression Inventory (BDI) is a self-report questionnaire that includes 21 question items, the furthermostcommonly used for depressionEvaluation. Training dataset is an important part of machine learning. After processing module using training dataset you test the model by creatingforecast against test set it is easy to govern whether the models guesses are correct. Emotion database can store the emotion keywordwhich is used for train dataset by comparing the keyword for finding the emotion.

## IV. SYSTEM ANALYSIS

### Algorithms

#### 1 : Stop word Removal Approach

**Input:** Stop words list  $L[]$ , String Data  $D$  for remove the stop words.

**Output:** Verified data  $D$  with removal all stop words.

**Step 1:** Initialize the data string  $S[]$ .

**Step 2:** initialize  $a=0, k=0$

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**Step 3:** for each(read a to L)

    If(a.equals(L[i]))

    Then Remove S[k]

End for

**Step 4:** add S to D.

**Step 5:** End Procedure

## 2 Stemming Algorithm.

**Input :** Word w

**Output :** w with removing past participles as well.

**Step 1:** Initialize w

**Step 2:** Intialize all steps of Porter stemmer

**Step 3:** for each (Char ch from w)

    If(ch.count==w.length()) && (ch.equals(e))

    Remove ch from(w)

**Step 4:** if(ch.endswith(ed))

    Remove 'ed' from(w)

**Step 5:** k=w.length()

    If(k (char) to k-3 .equals(tion))

    Replace w with te.

**Step 6:** end procedure

## Mathematical Model

Let S be the System

$S = (I, O, F_n, S_c, F)$

Where,

I-Inputs O-Output

$F_n$ -Functions or Modules

$S_c$ -Successful and F- Unsuccessful condition

$I = (V_i, T_i, S_t)$

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Where,

$V_i$  = Beck Depression Inventory Question

Answer

$T_i$ =Translated Voice Input To Text.

$S_t$ =Set of Sentences. such as Simple Sentence,

Compound Sentence, Complex Sentence.

$O = \{ \text{Positive, Negative, Neutral} \}$

$F_n = (VTC(), SA(), DC(), EC())$

Where,

VTC()-Voice to text Conversion

SA()-Sentiment Analysis

DC()-Data Checking

EC()-Emotion Checking

$S_c$ =When Emotion Data set is loads properly then it will give the proper Output.

$F$ =When Emotion Data set isn't loads properly then it will not give the proper Output.

## V. RESULTS AND DISCUSSION

For the system performance evaluation, calculate the matrices for accuracy. The system is executed on java 3-tier architecture framework with INTEL 2.7 GHz i3 processor and 4 GB RAM with proposed machine learning approach. The below Figure 2 shows the classification results for different test data size.

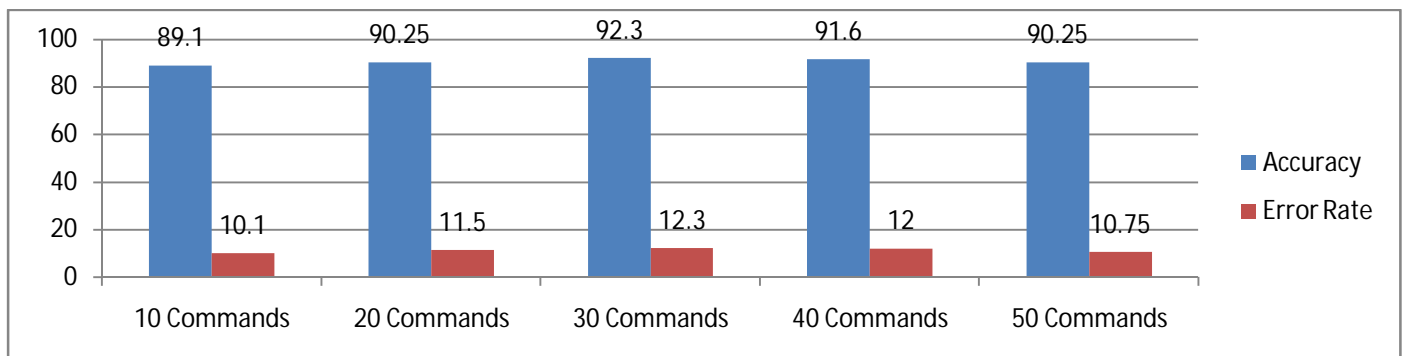


Fig. 2 : Accuracy of proposed system with different test instances

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The proposed NLP and Machine learning algorithm provides the best accuracy and result than existing algorithms.

## VI. CONCLUSION

The system proposed ways to detect three emotions to remove emotions from text input. Both keywords and effect bearings (ABW) are the main topics of our project to detect emotions from text. Experiments proved that Human speed was deeply dependent on the content of the sentence. As we know, it is still difficult to do semantic parsing by machine learning method. Even so, semantic information and some parts of emotional keywords such as Awesome Keywords and Direct Emotional Keywords are working in the system. The outcome displays that we have found relatively good results in finding the emotion through text input. In the future, we will try to upsurge the properties of our influenced lexicon and emotional datasets to enhance the performance of our approaches and to grow the accuracy of the whole system. The BDI tool which can be used in project is suitable for measuring depression due to their high validity as well as reliability but still having some limitation of that tool the limitation are Environmental problem like light voice. This limitation can be improved in future.

## REFERENCES

- [1]. Xue K, Xue Y, Hong J, Li W, Yue H, Wei [1] Smarr KL, Keefer AL. Measures of depression and depressive symptoms: Beck Depression Inventory-II (BDI-II), Center for Epidemiologic Studies Depression Scale (CES-D), Geriatric Depression Scale (GDS), Hospital Anxiety and Depression Scale (HADS), and Patient Health Questionnaire-9 (PHQ-9). Arthritis care & research. 2011 Nov 1;63(S11):S454-66.
- [2] Verma SS, Lucas A, Zhang X, Veturi Y, Dudek S, Li B, Li R, Urbanowicz R, Moore JH, Kim D, Ritchie MD. Collective feature selection to identify crucial epistatic variants. BioData mining. 2018 Dec;11(1):5.
- [3] Prathamesh Raut et. al. Depression Detection using BDI, Speech Recognition and Facial Recognition International Journal for Research in Applied Science & Engineering Technology (IJRASET) in 2018
- [4] Gupta AK. Psychological Disorder Detection Using NLP and Voice Command. Imperial Journal of Interdisciplinary Research. 2017 Nov 1;3(11).
- [5] Cai H, Han J, Chen Y, Sha X, Wang Z, Hu B, Yang J, Feng L, Ding Z, Chen Y, Gutknecht J. A Pervasive Approach to EEG-Based Depression Detection. Complexity. 2018;2018.
- [6] Wang YP, Gorenstein C. Assessment of depression in medical patients: a systematic review of the utility of the Beck Depression Inventory-II. Clinics. 2013;68(9):1274-87.
- [7] Yang Y, Ma Z, Hauptmann AG, Sebe N. Feature selection for multimedia analysis by sharing information among multiple tasks. IEEE Transactions on Multimedia. 2013 Apr;15(3):661-9.
- [8] Chandrashekar G, Sahin F. A survey on feature selection methods. Computers & Electrical Engineering. 2014 Jan 1;40(1):16-28.
- [9] Lazar C, Taminiau J, Meganck S, Steenhoff D, Coletta A, Molter C, de Schaetzen V, Duque R, Bersini H, Nowe A. A survey on filter techniques for feature selection in gene expression microarray analysis. IEEE/ACM Transactions on Computational Biology and Bioinformatics (TCBB). 2012 Jul 1;9(4):1106-19.
- [10] Li X, Hu B, Sun S, Cai H. EEG-based mild depressive detection using feature selection methods and classifiers. Computer methods and programs in biomedicine. 2016 Nov 1;136:151-61.