Psychological Disorder Detection Using NLP and Voice Command: A Survey

Hemant Bagade, Prof. K. S. Kore

P.G. Student, Department of Comp Engineering, SPCOE Otur, Pune, India

Professor, Department of Comp Engineering, SPCOE Otur, Pune, India

ABSTRACT: Mental disorder leads to difficulties in occupational, educational, social and marital relations. Failure to detect mental disorder denies patients effective treatment. This study aimed to assess the prevalence and nature of mental disorders by attending the physicians. So the main aim of our projects is to analyses the symptoms of individuals and applies each permutation to the situation to detect the disordered person. In our project, the input will be given in the form of speech. The speech will be converted to text using Google API. Then by applying NLP to text, sentiment analysis will do using BDI questions from the person will be asked. 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

Opinion mining (sometimes known as sentiment analysis or emotion (AI) refers to the use of natural language processing, text analysis, computational linguistics, and biometrics to systematically identify, extract, quantify, and study affective states and subjective information. Sentiment analysis is widely applied to voice of the customer materials such as reviews and survey responses, online and social media, and healthcare materials for applications that range from marketing to customer service to clinical medicine. Natural-language processing (NLP) is an area of computer science and artificial intelligence concerned with the interactions between computers and human (natural) languages, in particular how to program computers to fruitfully process large amounts of natural language data. The Beck Depression Inventory (BDI, BDI-1A, BDI-II), created by Aaron T. Beck, is a 21-question multiple-choice self-report inventory, one of the most widely used psychometric tests for measuring the severity of depression. Its development marked a shift among mental health professionals, who had until then, viewed depression from a psychodynamic perspective, instead of it being rooted in the patient's own thoughts.

II. LITERATURE SURVEY

2.1 Feature Selection to Simplify BDI for Efficient Depression Identification: In this paper, author Jiayue Cai, Jane Wang have presented an efficient BDI-based approach for depression identification in PD patients by identifying a subset of features using feature selection techniques and setting a new threshold in the simple sum-up rule. Moreover, In this paper provides some insights into gender differences for the assessment of depression. They select the top 5 features for male and female patients respectively and note that mood, loss of libido, work inhibition, self-accusation, social withdrawal are the most useful features for males while indecisiveness, mood, work inhibition, distortion of body image, crying are most useful in females. This observation reveals that there indeed exist distinct factors for the identification of depression between male and female individuals.[1].

2.2 Question Answering System on Education Acts Using NLP Techniques: The objective of this paper is to review some of the methods and implementation techniques which are used for implementing Question Answering System. On the basis of literal survey we can conclude that, Question answering system using NLP techniques is more complex compared to other type of Information Retrieval system. QA Systems can be developed for resources like web, semi-structured and structured knowledge- base domain. The Closed domain QA Systems give more accurate answer than that of open domain QA system but this system is restricted to single domain only. The QA system for closed domain of documents of related to education acts using NLP techniques and information retrieval are proposed to give the accurate and suitably more correct answers for user' queries.[2]

2.3 Semantic Information Retrieval: A comparative experimental study of NLP Tools and Language Resources for Arabic: This work is an attempt to semantically handle Arabic web Search. We are trying to enhance this vision of Search and to study all parameters which can improve it as tools and resources. Hence, we presented a Generic semantic search System based on contexts and senses of user queries terms. A module of QR is integrated in the System based on a knowledge-based approach for Arabic Semantic Disambiguation by use of Dictionary. The process of WSD is done based on a Sense Recognition algorithm. Different Semantic Information Retrieval approaches are experimented relying on Semantic Spaces (SS). Tests were made with use of different Morphological Analyzers and different linguistic resources. [3]

2.4 Continuous Speech Recognition System: A Review This paper author Pratik K. Kurzekar*, Ratnadeep R. Deshmukh, Vishal B. Waghmare, Pukhraj P. Shrishrimal would be helpful for the researchers to find the brief overview of continuous speech recognition systems developed in different languages.[10]

No	Title	Year	Author	Conclusion
1	Review on assessment of depression of BDI and Hamilton depression rating scale	2014	Leilishahlaei, Shahijan Has an	This study explain two kind of assessment which include: Beck Depression Inventory (BDI), Hamilton Depression Rating Scale (HDR). The paper recommends that the tools should be carefully applied in order to improve mental health and reduce the prevalence of depression.
2	Natural Language Processing Interface for Synonym	2014	Navdeep Kaur, Vandana Pushe, Rupinderdeep Kaur	This paper carries out various approaches for network construction in NLP. This paper also describe the various techniques of machine learning.
3	Question Answering System on Education Acts Using NLP Techniques	2016	Sweta P. LendeDr.M.M. Raghuwan-shi	This is the paper which describes the different methodology and implementation details of question answering system for general language .

4	Semantic In-Formation Retrieval: A comparative experimental study of NLP Tools and Language Resources for Arabic	2016	Nadia Soudani, Ibrahim Bounhasa, Yahya Slimania	In this paper try to exploit the semantic richness of Arabic language for Information Retrieval (IR).
5	Semantic Retrieval Approach for Web Documents,	2011	Harb, H. M., Khaled, M. F., Nagdy, M. N	Extract the data from web database using end users input command using machine learning as well as NLP.

III. EXISTING SYSTEM

In BDI (Beck Depression Inventory) the question is in the form of multiple choices. In that system person will select only one option from the given four options. From the user answers, system find out the mental state of the person that is, the person is in depress state or not. BDI has become one of the most widely used instrument for accessing the intensity of depression in psychiatric diagnose patient and for detecting possible depression in normal population. The user can not give his own answer. He has limited Option i.e. in the form multiple choice which is given by the system to the user. User only selects the option among them so system cannot find the proper mental state of the user.

IV. PROPOSED APPROACH

In proposed system the user will give the answer of question in the form 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. Psychological Disorder Detection is useful for finding the depression of the people for that purpose we used BDI question but this BDI question is in the form of multiple choice. Now we are developing the system in that user can answer his own answer.

V. RESEARCH METHODOLOGY

Word Process Module: The Word-processing module consists of tokenization, Parts-of-speech tagging, negative sentence extracting, and searching keywords from positive sentence. This enables us to find emotion bearing words from a given sentence. [3]

Emotion Detection Module: Emotion detection methodologies use the concepts and algorithm that are created for subjectivity and sentiment analysis.

Sentence Analysis: In this sentence analysis module, our aim is to detect emotion from a sentence where there is no emotional keyword in the sentence. For this purpose, we analyze different categories of sentence.

BDI: BDI stands for Beck Depression Inventory. The Beck Depression Inventory (BDI) is a self-report questionnaire consisting of 21 question items, has been the most extensively used for depression assessment.

Train Dataset: Training dataset is an important part of machine learning. After processing module using training dataset you test the model by making prediction against test set it is easy to determine whether the models guesses are correct.

Emotion Database: Emotion database can store the emotion keyword which is used for train dataset by comparing the keyword for finding the emotion.

VI. CONCLUSION

In our project, we propose three emotion detection methods to extract emotion from text input. Both the keywords and Affect Bearing Word (ABW) are the main topic of our project to detect emotion from text. Experiments proved that human motion was deeply depended on the content word of the sentence. As we know, it is still difficult to do the semantic parsing with machine learning method. Nevertheless, some part of the semantic information and emotional keywords such as exclamatory keywords & direct emotional keywords have been work out in the system. The result shows that we have got relatively good results for emotion detection from text input.

REFERENCES

[1]. Jayme Cai, Z. Jane Wang "Feature Selection to Simplify BDI for Efficient Depression Identification" s 2016 Department of Electrical and Computer Engineering University of British Columbia Vancouver, Canada.
[2]. Sweta P. Lende "Question Answering System on Education Acts Using NLP Techniques" In 2016 IEEE Sponsored World Conference on Futuristic Trends in Research and Innovation for Social Welfare.
[3]. Nadia Soudani , Ibrahim Bounhasa, Yahya Slimania, "Semantic Information Retrieval: A comparative experimental study of NLP Tools and Language Resources for Arabic" In 2016 IEEE 28th International Conference on Tools with Artificial Intelligence.
[4]Farghaly, A., Shaalan, K. : Arabic natural language processing: Challenges and solutions. ACM Trans, Asian Lang. Inform. Process., 8:14:1–14:22 (2009) .
[5]Harb, H. M., Khaled, M. F., Nagdy, M. N.: Semantic Retrieval Approach for Web Documents, International Journal of Advanced Computer Science and Applications (IJACSA), 2 (9), pp.11–75 (2011).
[6]Amit Mishra, Nidhi Mishra and Anupam Agrawal, "ContextAware Restricted Geographical Domain Question Answering System", In 2010 International Conference on Computational Intelligence and Communication Networks.
[7] Zeng-Jian Liu, Xiao-Long Wang and Qing-Cai Chen "A Question answering system on web search" International conference on machine learning 2014.
[8].Lahiru Samarakoon, Sisil Kumarawadu "Automated Question Answering for customer Helpdesk Application" 2011 6th Internation conference on Industrial and Information System.
[9] Pukhraj Shrishrimal, R.R. Deshmukh, and Vishal Waghmare "Indian Language Speech Database: A Review". International Jouranal of computer Application (IJCA). Vol 47, No. 5, pp, 17-21, 2012.
 [10] Pratik K. Kurzekar*, Ratnadeep R. Deshmukh, Vishal B. Waghmare, Pukhraj P. Shrishrimal "Continuous Speech Recognition System: A Review" 2014 Asian Journal of Computer Science and Information Technology.