

Depression Detection On Social Media Data Using Naive Bayes, CNN And Flask.

Amit Bawankar¹, Abhijeet Mate², Harshad Palve³, Mohan Khawale⁴
, Wasudeo Rahane⁵

^{1,2,3,4}B.E. Student, Dept. of Information Technology, NBN Sinhgad School of Engineering, Ambegaon, Pune-411041, Maharashtra, India

⁵Professor, Dept. of Information Technology, NBN Sinhgad School of Engineering, Ambegaon, Pune-411041, Maharashtra, India

To Cite this Article

Amit Bawankar¹, Abhijeet Mate², Harshad Palve³, Mohan Khawale⁴

, Wasudeo Rahane⁵, "Classifying Houses suitable for Electric Vehicle Charging Point using Neural Network", Journal of Science and Technology, Vol. 06, Special Issue 01, August 2021, pp06-10: .

Article Info

Received: 15.07.2021

Revised: 24.07.2021

Accepted: 10.08.2021

Published: 16.08.2021

-----***-----

Abstract - Suicide is considered as a serious social health issues that exists in today's culture. Suicidal ideation, also known as suicidal thoughts, refers to people's plans to commit suicide. It can be used as a suicide risk measure. India stands in top countries in the world to have annual suicide rate. Social networks have been developed as a first-rate factor for its users to communicate with their interested buddies and proportion their captions, photos, and videos reflecting their moods, emotions and sentiments. To increase and put in force a version which takes a facial expression images as an enter and symptoms. On the basis of that it predicts the repute of that patient whether or not he/she has been detected or now not detected for depressed. We can train version using photographs & will use it for prediction. Image captioning can be accomplished after prediction for higher visualization of report. We will also use text mining (NLP) technique to predict melancholy the usage of signs furnished with the aid of person.

At final we are able to make final choice primarily based on above two techniques. To generate detailed dashboard of user disease status and to design webapp for above system. We will use CNN algorithm for speed up detection of depressed character instances and approach to become aware of high quality answers of mental health troubles. We suggest system learning method as an efficient and scalable technique.

Key Words: Suicide rate, Emotions, Convolutional Neural Network.

1. INTRODUCTION

In the Indian sense, suicide is a serious problem. Suicide claims the lives of over one lakh (one hundred thousand) people in our country each year. The suicide rate has risen from 7.9 to 10.3 per 100,000 in the last two decades. Within the world, there is a wide range of suicide rates. Kerala, Karnataka, Andhra Pradesh, and Tamil Nadu are among the southern states with the highest suicide rates.

Over the past two decades, this variable trend has remained consistent. Higher suicide rates in the southern states may be explained by higher literacy, a stronger reporting system, lower external violence, higher socioeconomic status, and higher aspirations. The number of suicides in India rose to 230,314 in 2016. Suicide was the leading cause of death in both the 15-29- and 15-39-year age groups. Every year, approximately 800,000 people die by suicide around the world, with 135,000 (17%) of these being citizens of India, which accounts for 17.5 percent of the global population. Suicide by "hanging" (53.6%), "eating

poison" (25.8%), "drowning" (5.2%), and "self-immolation" (3.8%) were the most common methods of suicide throughout the year, according to the report.

According to a new World Health Organization (WHO) survey, India had the highest suicide rate in the South-East Asian region in 2016. For the past three years, India's own official statistics, which map the number and causes of suicides in the country, have been unavailable, hampering suicide prevention strategies and efforts to enforce WHO recommendations in this region. The study used data from the WHO Global Health Estimates for 2016 to present suicide rates for countries and regions. India belongs to the South-East Asia region and the Lower Middle-Income category of countries when ranked by region and income. India's suicide rate (16.5) was higher than its geographic region's (13.4) and income group's (11.4) rates (11.4).

1.1 Problem Definition

To design system which involves extraction of facial features to detect stress. Classification of emotions using the Convolutional Neural Network (CNN) algorithm and classify positive and negative emotions and detects the stress based on usual threshold value.

1.2 Proposed system

As studied, we observed that naive Bayes and support vector machine algorithms are giving better performance than other models. But the accuracy which we are getting is not good. The accuracy which was obtained is stuck between 80 to 85 %. So, to improve the performance of depression detection systems we need to use other powerful algorithms. The traditional machine learning algorithm follows steps like data collection, preprocessing, model selection, model training, evaluation, parameter tuning, and prediction. With the help of ensemble learning, we combined different individual models to get the improved and powerful final model.

In an existing system given in this paper [3], only an individual classifier is used as given in the training diagram. A multinomial naive Bayes classifier is used and gives 83 % accuracy. We will use different individual classifiers and then we will apply ensemble methods with some modification to get accurate results.

2. LITERATURE SURVEY

Significant research is happening on the characteristics of depression [9–12]. Choudhury et al. [13] suggest that depression can be a true measure of one's own and society's well-being. A large number of people suffer from the negative effects of depression, but only a small percentage receives adequate care each year. They used behavioral credits related to social interaction, feeling, dialect and semantic types, meaning of the self-system, and notes of antidepressant drugs via their web-based social networking postings.

Choudhury et al. [14] considered online networking as a tool for depression detection. They used Twitter posts to track 376 mothers' postpartum changes in terms of social interaction, feelings, and information. [15] Found that Twitter is increasingly being investigated as a tool for detecting psychological issues. Depression and sociality are examples of poor mental health in the general population. It was discovered during their investigation that it is possible to determine the extent of anxiety among suicidal people. Using both human coders and a machine learning algorithm, we were able to find similar tweets. Clients may share their desires and feelings on social media sites because they are available. Using mood, psycholinguistic processes, and drug subjects omitted from the posts generated by individuals from these groups, Nguyen et al. [20] used machine learning algorithms to detect positive and negative emotions. Holleran [9] Detected depression using Facebook user data

3. METHODOLOGY

In this project, Face is captured using the camera. This detected face is processed and the emotions are classified as either positive or negative emotions. The detected image is processed to identify the face of the subject using Convolutional Neural Network (CNN) algorithm.

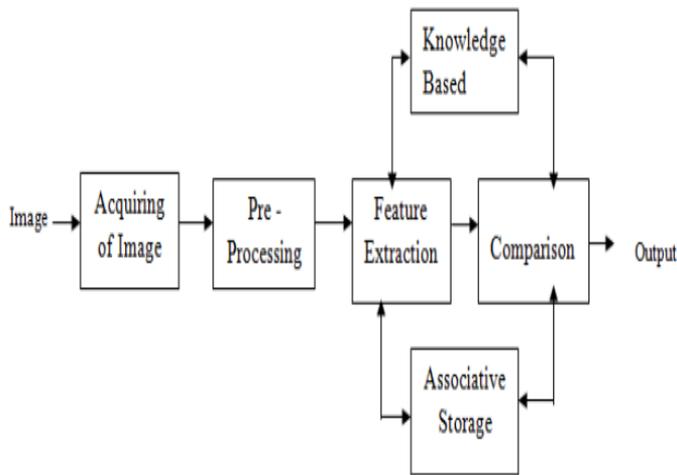


Fig. Methodology

Camera is used to capture face of a person which is then cropped and processed before applying to ML algorithm. Emotion is estimated using this face. CNN algorithm is used to detect depression and of person. Finally text SMS is sent to user using twilio web service.

3.1 Flowchart

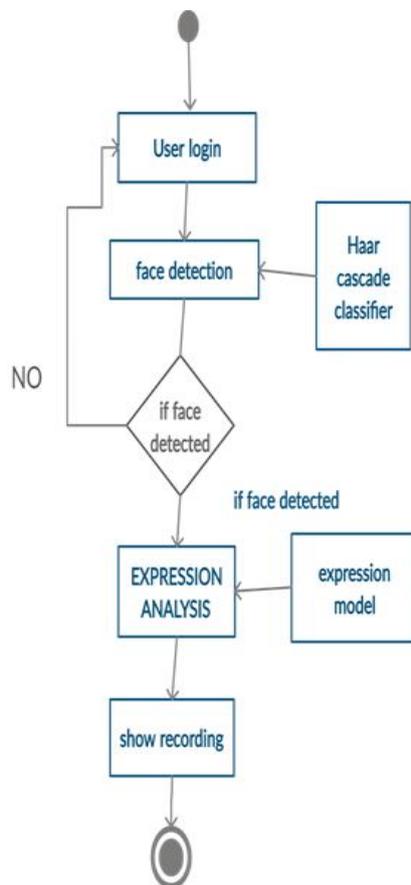


Fig. Flow of the system

3. RESULT

We tested our system to detect emotions of different users. We have detected emotions and classified them into 7 different categories. We achieved more than 90% accuracy. Also text mining approach is also tested for more than 90% accuracy.

4. CONCLUSIONS

The implemented system detects depression at two levels. 1stly using facial expressions and then using text mining approach. So, this method is more accurate as compared with only facial expression detection system. This system will help to prevent suicide by early detection of it.

5. FUTURE SCOPE

In future work, the language limit on this model will be reduced and more than one language will be taken as a sample. In a future project, we plan to use embedded hardware for project implementation. Also, database size can be increased. In future Facebook users, can be used to detect emotion of person and finally depression can be calculated.

6. REFERENCES

[1] Scott J. Social network analysis. Thousand Oaks: Sage; 2017.

- [2] Serrat O. Social network analysis. In: Knowledge solutions. Singapore: Springer; 2017. p. 39–43.
- [3] Mikal J, Hurst S, Conway M. Investigating patient attitudes towards the use of social media data to augment depression diagnosis and treatment: a qualitative study. In: Proceedings of the fourth workshop on computational linguistics and clinical psychology—from linguistic signal to clinical reality. 2017.
- [4] Conway M, O'Connor D. Social media, big data, and mental health: current advances and ethical implications. *Curr Opin Psychol.* 2016;9:77–82.
- [5] Ofek N, et al. Sentiment analysis in transcribed utterances. In: Pacific-Asia conference on knowledge discovery and data mining. 2015. Cham: Springer.
- [6] Yang Y, et al. User interest and social influence based emotion prediction for individuals. In: Proceedings of the 21st ACM international conference on Multimedia. 2013. New York: ACM.
- [7] Tausczik YR, Pennebaker JW. The psychological meaning of words: LIWC and computerized text analysis methods. *J Lang Soc Psychol.* 2010;29(1):24–54.
- [8] Pennebaker JW, Francis ME, Booth RJ. Linguistic inquiry and word count: LIWC 2001, vol. 71. Mahway: Lawrence Erlbaum Associates; 2001. p. 2001.
- [9] Holleran SE. The early detection of depression from social networking sites. Tucson: The University of Arizona; 2010.
- [10] Greenberg LS. Emotion-focused therapy of depression. *Per Centered Exp Psychother.* 2017;16(1):106–17.
- [11] Haberler G. Prosperity and depression: a theoretical analysis of cyclical movements. London: Routledge; 2017.
- [12] Guntuku SC, et al. Detecting depression and mental illness on social media: an integrative review. *Curr Opin Behav Sci.* 2017;18:43–9.
- [13] De Choudhury M, et al. Predicting depression via social Media. In: ICWSM, vol. 13. 2013. p. 1–10.
- [14] De Choudhury M, Counts S, Horvitz E. Predicting postpartum changes in emotion and behavior via social media. In: Proceedings of the SIGCHI conference on human factors in computing systems. New York: ACM; 2013.
- [15] O'Dea B, et al. Detecting suicidality on Twitter. *Internet Interv.* 2015;2(2):183–8. Signs Symptoms Behaviour Not going out any longer Not completing things at work Not doing regular charming exercises Unfit to focus Feelings Overwhelmed Blameworthy Irritate Disappointed Unlucky Worried Thoughts He is winner It's my pleasure Nothing good ever happens to me He was unlucky Life is not the bed of roses He would not be able to work without me Physical Tired Illness Headaches Depression problem Misfortune Islam *et al. Health Inf Sci Syst (2018).*
- [16] Zhang L, et al. Using linguistic features to estimate suicide probability of Chinese microblog users. In: International conference on human centered computing. Berlin: Springer; 2014.
- [17] Aldarwish MM, Ahmad HF. Predicting depression levels using social media posts. In: 2017 IEEE 13th international Symposium on Autonomous decentralized system (ISADS). 2017.
- [18] Zhou J, et al. Measuring emotion bifurcation points for individuals in social media. In: 2016 49th Hawaii international conference on system sciences (HICSS). 2016. Koloa: IEEE.
- [19] Wang X, et al. A depression detection model based on sentiment analysis in micro-blog social network. In: Trends and applications in knowledge discovery and data mining (PAKDD). 2013.

- [20] Nguyen T, et al. Affective and content analysis of online depression communities. *IEEE Trans Affect Comput.* 2014;5(3):217–26.
- [21] Park M, McDonald DW, Cha M. Perception differences between the depressed and non-depressed users in Twitter. In: *ICWSM*, vol. 9. 2013. p. 217–226.
- [22] Wee J, et al. The influence of depression and personality on social networking. *Comput Hum Behav.* 2017;74:45–52.
- [23]. Bachrach Y, et al. Personality and patterns of Facebook usage. In: *Proceedings of the 4th annual ACM web science conference.* 2012. New York: ACM.
- [24] Ortigosa A, Martín JM, Carro RM. Sentiment analysis in Facebook and its application to e-learning. *Comput Hum Behav.* 2014;31:527–41.
- [25] Shen G, et al. Depression detection via harvesting social media: A multimodal dictionary learning solution. In: *Proceeding of the twenty-sixth international joint conference on artificial intelligence (IJCAI-17).* 2017. p. 3838–3844.