

Dissect Monograph Methods and Applications of Machine Learning in Mental Health

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Abstract :Mental health refers to our cognitive, behavioural, and emotional wellbeing. Mental health can affect relationships, daily life, and also physical health. Mental health also includes a person's ability to enjoy their life. Anxiety and depression are common among people. Identifying these issues are difficult. The present situations rely only on self reporting. Now many sensing technologies are providing powerful mechanism to track, model, and understand a range of health behaviours and well-being states of the people with mental disorder. Among these social media is an inconspicuous sensing technology that helps to address complex challenges. For several mental health issues, psychiatric symptoms are crucial for in-time intervention This paper focus on most common mental health disorders and discuss the predictive models designed to discover the early signs of these issues.

Index Terms: Machine Learning, Depression, Sentiment Analysis, Schizophrenia

I. INTRODUCTION

Mental illness is not taken as a serious issue in many countries including in India. People are not getting much exposure to mental illness education in school or in colleges. Also people are worried about the society they live in, if they try to get help from professionals. Recently many college students are committing suicide because of depression. If they have expressed their feeling to any professionals, then this could have been avoided. Depression can happen at any time and to anyone. Losing a job, losing loved ones, even for silly reasons like small disappointments or even some tough situations in job or in family may lead a person to feel blue. Every human may get some tough situations in life and may experience sadness at times. May feel completely stressed out, but should overcome from those problems by themselves or should seek help from persons who are good counsellors or psychiatrist. Recent years most of the people are addicted to usage of mobile phones and made it as one of their basic need.

Moods are shared among people through social media. They express their feelings by posting some emotional pictures or sending some messages with emojis which showcase their mood. Apart from clinical observations, researchers use data that are available in social medias and do analysis using any of the machine learning algorithms and predicts the percentage of illness of a person affected with any of the mental health issues.

II. MENTAL HEALTH AND MACHINE LEARNING

Machine Learning plays a vital role in the field of mental health and supports for detection and diagnosis of mental illness, prognosis treatment and support required for the affected persons, and for clinical administration for helping them out to identify the persons with mental . Using Machine learning we can address many mental health issues like schizophrenia, depression and mood disorders. Various Machine learning techniques considered for these are support vector machines, clustering, decision trees and neural networks. Data mining and machine learning techniques can be implemented to online communities related to mental health.

III. MENTAL HEALTH AND SOCIAL MEDIA

Social media platforms have earned the popularity and most of the people are connected to it and stay for longer. Emotional well being of a person can be accessed through their post on the social media. People from different fields have potential connections between social media and mental health. They all share their good and bad. Excessive use of social media also contributes to depression. Methods of sentiment analysis can be used to calculate the depression inclination of each post. Using machine learning approaches, model can be created to scan twitter feeds and measures the degree of depression.

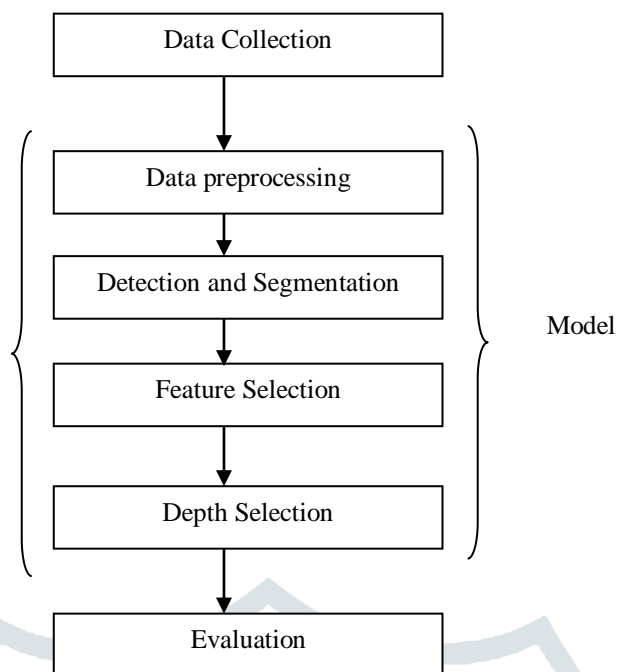


Fig 1. Machine Learning Approach

3.1 Depression

Depression is one form of mental disorder that is more common among woman than men. Depression can occur at any time in a person. Major causes are the loss of loved one, ending of a relationship or a social isolation. To diagnose depression, one should consult a psychiatrist of a mental health specialist for effective way of treatment. But due to lack of awareness about this, people will not disclose this to any one and express their emotions in form of messages in public forums. Madhurima Hood in 2017 focused on the prediction of depression using the following methods: Machine Learning Classifiers, Imaging and Risk factors [1]. Emotion analysis have effective research approach for modelling depressive states. We have a wide range of automated emotion analysis for depression related mental health issues [2], [3], [4].

3.2 Schizophrenia

Schizophrenia is a serious mental health disorder and a severe long term mental health condition which affects how a person thinks, feels and acts. schizophrenia may have difficulty distinguishing between real and imaginary and also have difficulty in expressing normal emotions in social situations. Amicie de Pierrefeu expressed that the use of machine-learning (ML) in neuroimaging offers new assessments in early diagnosis and prognosis of brain diseases[5]. Very few studies have anticipated on a completely independent validation to estimate prediction performances of a classifier [6,7,8].

IV. SENTIMENT ANALYSIS

Sentiment analysis is contextual mining of text. It extracts the identified subjective information in source material, and also helping a business to understand the social sentiment of their brand, product or service. These are monitored using online conversations. It determines whether a text entered is positive, negative or neutral. This was done by extracting particular words or phrases. Xueying Zhang, in 2016 based on the dataset collected, the supervised machine learning methods are introduced for sentiment analysis. Supervised learning is a type of the machine learning task. It infers a function from labelled training data that consists of a set of training examples [9].

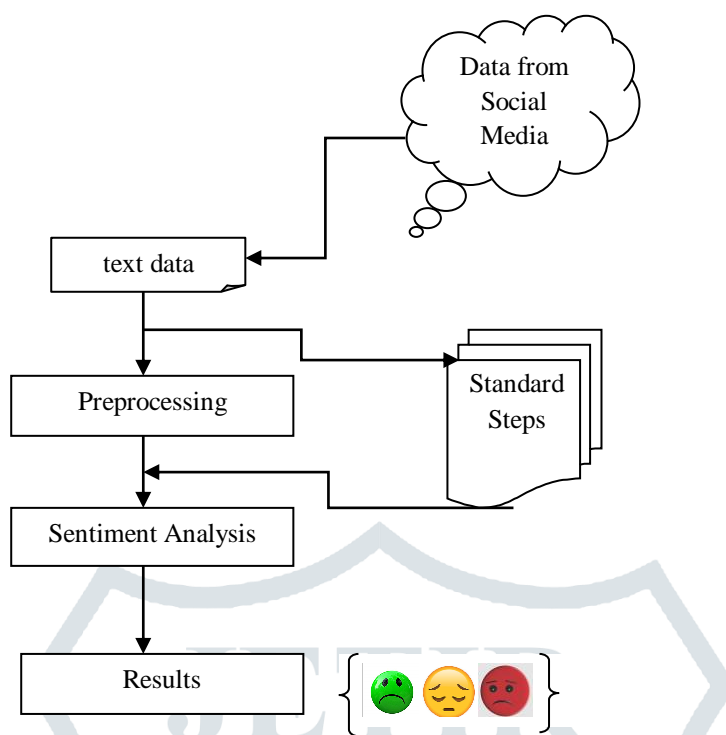


Fig 2. Sentiment Analysis Classifier

V. CONCLUSION

Mental ill health was the new priority challenge. It seems to be associated with major problems in life. Depression and Schizophrenia are the most common condition in primary care which is often unrecognized and undiagnosed. This paper stressed on the challenges of using ML techniques as well as opportunities to improve and advance the field. All paper surveyed expresses that depression is conceptualised as an epidemic, more attention needs to be given to the *reasons* for high rates of depression in the population, rather than exclusively resourcing containment strategies such as clinical research, treatment and anti-stigma campaigns.

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