Stress and Depression Detection Via Social Media Using Machine Learning

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ABSTRACT

Depression accounts for a large portion of the global disease burden. Doctors used to diagnose sad people in person using clinical depression criteria. The COVID-19 pandemic encapsulates huge forces such as unemployment, mortality, and loneliness, among other things. When clinicians are called upon, they must distinguish between demoralization and depression. However, more than 70% of patients do not seek medical assistance in the early stages of depression, causing their illnesses to worsen. Meanwhile, as people use social media more and more to express themselves and share their daily lives, it has shown to be a useful tool for diagnosing physical and mental problems. We use social media data to forecast depressed persons and define their depression severity in order to help raise an alarm in this paper. A supervised learning task is used to mimic this problem. We begin by weakly labeling the Twitter data in a self-supervised manner. A rich set of features, including emotional, topical, behavioral, user level, and depression-related n-gram features, are retrieved to characterize each user. We use Swish as an activation function to train a small long short-term memory (LSTM) network to predict depression intensities using these features. Extensive research is conducted to demonstrate the efficacy of our technology.

Keywords- Social Media, Machine Learning, Depression detection, Medical.

INTRODUCTION

The most frequent cause of disability in the world is depression. 350 million people worldwide are believed to suffer from depression at some point in their lives. Depression symptoms manifest themselves in unique ways in depressed individuals. Clinical diagnoses are frequently made through face-to-face interviews with psychologists who use criteria from the DSM-IV-TR. When clinicians are called upon, they must be able to discern between demoralisation and depression. According to the criteria, there are nine main types of depressive symptoms. In spite of its efficacy, many people are embarrassed or unaware of their sadness. In 2000, depression cost the United States an annual economic burden of 83 billion dollars, the majority of which was attributed to poorer productivity and higher medical costs.. About 15 to 20 percent of those with major depressive illness commit suicide, according to a study by Goodwin and Jamison. Depression can be prevented in many cases with appropriate treatment and early detection of depression is the first step in applying these treatments. The vast bulk of research into the early detection of depression relies on patient surveys and self-reports for diagnosis. Only 30% of countries providing basic health care services have these systems in place in 2009, making them prohibitively expensive.

Many factors have contributed to the outbreak of the COVID-19 pandemic. Unemployment, bereavement of loved ones, financial insecurity, and social isolation are just a few of the more obvious ones for those who live alone. COVID-19 is a pandemic affecting the United States and many other countries, and I strive to stay up to current on the latest developments. This opinion was sparked by two headlines and a slew of phone calls and e-mails from coworkers and friends, among other sources. "What We Must Do To Prevent a Global COVID-19 Depression" and "COVID-19 Could Lead to an Epidemic of Clinical Depression and the Health Care System Isn't Ready for That, Either" are the two headlines that recently drew my attention. There is little doubt that this pandemic is wreaking havoc on the economies of many individuals, as well as putting a strain on many people's ability to cope.

A deep learning-based technique for assessing the degree of depression is proposed in this study, based on information that the user posts on social media. This is the first study of its sort to attempt to gauge the severity of depression, to the best of our knowledge. We begin by renaming the dataset provided by Shen et al. Self-supervised classification based on textual

measuring the probabilities that result, this approach appears to hold promise. Combining word embedding models in a single neural network has not been tested either.

T. Cai et al, proposed on the basis of Targetaware holistic influence maximisation in spatial social networks. For the purposes of this paper, we investigate the new research problem of Holistic Influence Maximization (HIM), which is an important add-on to the more traditional IM problem and has the potential to improve numerous real-world applications. By analysing four datasets, we found that one or two orders of magnitude can be gained in efficiency in our experiment.
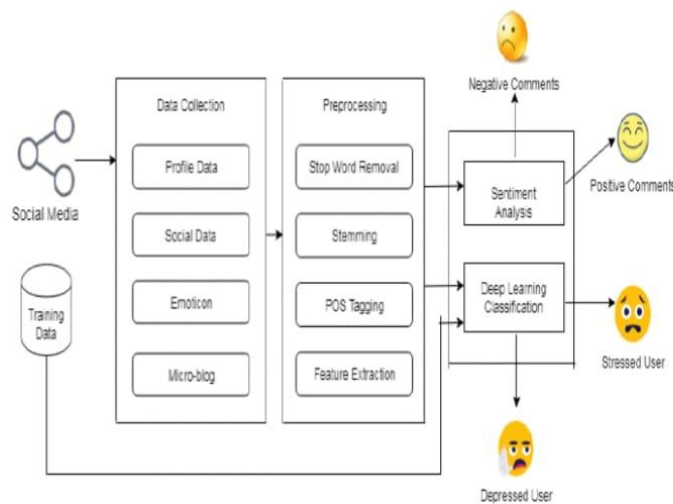
N. Asghar et al, proposed based on the generation of emotional neural responses In this paper, three emotional tactics are used to enhance the development of affectively conscious neural encoder decoder conversation systems.. An affective space is created using a cognitively constructed dictionary, and a variety of affect-based heuristic objective functions and decoding algorithms are proposed. Information retrieval activities such as question-answering and dialogue systems can be retained by interacting with users in a more compassionate and human way using these strategies

R. I. Shader et al , proposed on the basis of depression and the COVID-19. Among other things, the COVID-19 pandemic encompasses unemployment, death, and isolation. When called upon, clinicians must be able to tell the difference between demoralisation and depression. Both depression and demoralisation can be treated with this statement's remedies, as well as with a warning about the use of chloroquine or hydroxychloroquine in patients with COVID-19 syndrome. It is imperative that the risks and benefits of both treatments are thoroughly evaluated before promoting either one over the other.
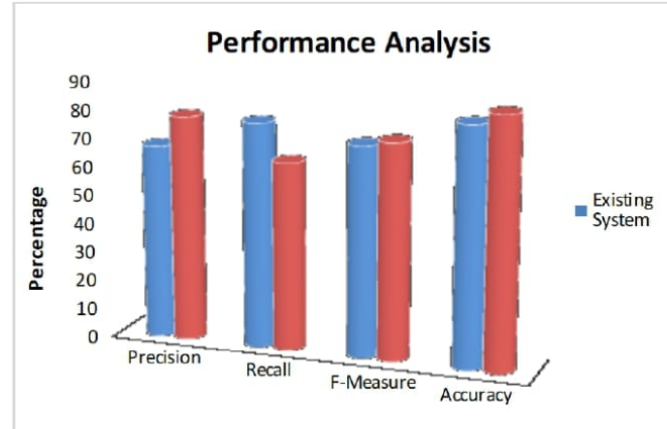
Proposed System
Depression intensity analysis does not have a large-scale benchmark dataset that is publicly available. A dense labelling strategy is now being devised to re-label the original sparsely labelled dataset with depression intensity. The technique can be applied to a wide range of users because we define attributes that correspond to each one of them. If you want to predict a person's level of depression, you'll need to process social data, extract features from it, and train an algorithm in the proposed system. Using our feature set and model, we can use binary labelling to determine whether a person is depressed (i.e., whether the person is depressed or not). For binary classification, we extract features from weights that have been trained to predict depression intensity. In terms of accuracy, our approach beats theirs by more than 2%. Our extensive research into the proposed strategy's efficacy is the result of these tests. We outperform other comparable models, as well as existing binary classification approaches, in terms of intensity estimates.

System Architecture

RESULTS AND DISCUSSION

	Existing System	Proposed System
Precision	67.78	78.70
Recall	79844	65.64
F-Measure	73.11	74.31
Accuracy	83.29	87.26

CONCLUSION

For this research, the ultimate goal is real-time social media diagnosis of depressive disorders. During the ongoing COVID-19 pandemic and numerous lockdowns, mental health has been a major source of concern. We proposed a deep learning method based on social media data to estimate the severity of depression. It is the goal of this project to use social media in real time to estimate the severity of depression in order to assist in the selection of the most appropriate therapy. Relabeling a benchmark depression dataset, creating a rich collection of discriminative depression-related variables for users, and proposing an LSTM network to detect depressed Twitter users of various levels were all done in a self-supervised manner. Numerous tests on a standard dataset showed that our method was superior to the others in terms of estimating intensity.

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