A Deep Learning approach towards Early Detection of Depression through Twitter Posts

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***Abstract*—This research aims to perform sentiment analysis techniques to discern signs of depression within a corpus of random tweets. The primary objective is to develop a classification model capable of distinguishing between ordinary and depressive tweets, with the latter characterized by the presence of depression-related keywords. Social media platforms, particularly Twitter, serve as vital mediums for instantaneous global communication, where individuals often subtly disclose their mental health struggles amidst routine updates. Recognizing early indicators of mental health challenges through social media engagement holds significant potential for timely intervention and support. This study aims to contribute to this endeavor by constructing a model proficient in extracting tweets indicative of depression, anxiety, or passive suicidal ideation from extensive social media datasets. The proposed methodology leverages advanced machine learning techniques, emphasizing sentiment analysis, to discern patterns indicative of mental health distress. The findings of this research hold implications for the development of automated tools facilitating the early detection and support of individuals grappling with mental health issues in digital contexts.**

Keywords— Sentiment analysis, twitter, depression detection, mental health, machine learning, sentiment classification.

I. Introduction

In recent years, mental health has emerged as a critical aspect of overall well-being, garnering increasing attention from both the public and healthcare professionals. Among the myriad of mental health disorders, depression stands out as one of the most prevalent and debilitating conditions globally. Characterized by persistent feelings of sadness, hopelessness, and loss of interest in previously enjoyed activities, depression affects millions of individuals worldwide, irrespective of age, gender, or socioeconomic status.

The significance of addressing depression and promoting good mental health cannot be overstated. Mental health is intricately linked to various aspects of an individual's life, including their physical health, relationships, work productivity, and overall quality of life. A robust mental health foundation not only fosters resilience in coping with life's challenges but also enhances one's ability to form meaningful connections and pursue personal aspirations. Conversely, untreated depression can lead to a myriad of adverse outcomes, ranging from impaired functioning and decreased productivity to heightened risk of substance abuse and suicide.

Against this backdrop, the role of social media platforms, particularly Twitter, in shaping mental health discourse has become increasingly prominent. Social media serves as a double-edged sword, providing avenues for instant communication and global connectivity, while also exposing individuals to a barrage of information and potential stressors. Within this digital landscape, individuals often use social media as a platform to express their thoughts, emotions, and experiences, including struggles with mental health issues. Consequently, analyzing social media content for signs of depression and other mental health concerns holds promise for early intervention and support.

This paper aims to explore the intersection of mental health and social media through the lens of sentiment analysis. Specifically, we seek to develop a classification model capable of detecting depressive tweets by leveraging machine learning techniques. By harnessing the vast amounts of data generated on social media platforms like Twitter, our objective is to identify individuals who may be in need of mental health support and facilitate timely interventions. Through this research, we endeavor to contribute to the burgeoning field of digital mental health interventions and enhance our understanding of the role of social media in promoting mental well-being..

II. Ease of Use

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TABLE I. TABLE TYPE STYLES

Table Head	**Table Column Head**		
	Table column subhead	***Subhead***	***Subhead***
copy	More table copy[a]		

[a.] Sample of a Table footnote. (*Table footnote*)

Fig. 1. Example of a figure caption. (*figure caption*)

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REFERENCES

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[1] G. Eason, B. Noble, and I. N. Sneddon, "On certain integrals of Lipschitz-Hankel type involving products of Bessel functions," Phil. Trans. Roy. Soc. London, vol. A247, pp. 529–551, April 1955. *(references)*

[2] J. Clerk Maxwell, A Treatise on Electricity and Magnetism, 3rd ed., vol. 2. Oxford: Clarendon, 1892, pp.68–73.

[3] I. S. Jacobs and C. P. Bean, "Fine particles, thin films and exchange anisotropy," in Magnetism, vol. III, G. T. Rado and H. Suhl, Eds. New York: Academic, 1963, pp. 271–350.

[4] K. Elissa, "Title of paper if known," unpublished.

[5] R. Nicole, "Title of paper with only first word capitalized," J. Name Stand. Abbrev., in press.

[6] Y. Yorozu, M. Hirano, K. Oka, and Y. Tagawa, "Electron spectroscopy studies on magneto-optical media and plastic substrate interface," IEEE Transl. J. Magn. Japan, vol. 2, pp. 740–741, August 1987 [Digests 9th Annual Conf. Magnetics Japan, p. 301, 1982].

[7] M. Young, The Technical Writer's Handbook. Mill Valley, CA: University Science, 1989.