

ABSTRACT

Social media now serves as a primary platform for people to share experiences and views, including those related to mental health. However, existing data analysis faces several challenges, such as differences in data types, such as text and images, and complex expression patterns. This study aims to design a multimodal sentiment analysis model that can detect mental health issues on social media platform X by combining Convolutional Neural Network (CNN), Gated Recurrent Units (GRU), and FastText feature expansion. The proposed methodology involves real-time data collection from social media platform X, including text and images. The text data is processed using standard preprocessing techniques and FastText feature representation, while the visual data is extracted using VGG-16 to recognize relevant visual patterns. 24,742 tweet-image pairs were collected from the Twitter platform and annotated using a majority voting system. To build the FastText similarity corpus, 63,512 data sets from the digital news portal CNN and Twitter were combined, and modality fusion was performed through an integration layer to produce the final sentiment classification (positive and negative). Evaluation results on the test dataset showed that this method was able to improve sentiment detection accuracy by up to 0.12% compared to text-only methods. Overall, the accuracy achieved reached 87.89%. With this achievement, it is hoped that this research can serve as a reference for more effective monitoring of mental health issues on social media platforms.

Keywords: Multimodal Sentiment Analysis, VGG-16, Hybrid CNN-GRU, TF-IDF, FastText.