# CONCLUSION

This paper developed an efficient tweet classification model to enhance the effectiveness of topic models for the detection of cyber-bullying events. DEA RNN was developed by combining both the DEA optimization and the Elman type RNN for efficient parameter tuning. Furthermore, it was tested in comparison with the existing Bi-LSTM, RNN, SVM, RF, and MNB methods on a newly created Twitter dataset, which was extracted using CB keywords. The experimental analysis showed that the DEA-RNN had achieved optimal results compared to the other existing methods in all the scenarios with various metrics such as accuracy, recall, F-measure, precision, and specificity. This signifies the impact of DEA on the performance of RNN. Although the hybrid proposed model obtained higher performance rates than the other considered existing models, the feature compatibility of DEA-RNN reduces when the input data is increased greater than the initial input. The current study was limited only to the Twitter dataset exclusively; other Social Media Platforms (SMP) such as Instagram, Flickr, YouTube, Face book, etc., should be investigated in order to detect the trend of cyber bullying. Then, the possibility of utilizing multiple source data for cyber-bullying detection will be investigated in the future. Furthermore, we performed

the analysis only on the content of tweets; we could not perform the analysis in relation to the users' behavior. This will be in future works. The proposed model works to detect cyber bullying utilizing textual content of tweets, whereas theother type of media such as images, video, and audio is still an open research area and future research directions. Besides, we aim to classify and detect CB tweets in a real-time stream.