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A Hybrid Deep Learning Model for Long Term Sentiment Analysis

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Abstract

With the omnipresence of user feedbacks in social media, mining of relevant opinion and extracting the underlying sentiment to analyze synthetic emotion towards a specific product, person, topic or event has become a vast domain of research in recent times. A thorough survey of the early unimodal and multimodal sentiment classification approaches reveals that researchers mostly relied on either corpus based techniques or those based on machine learning algorithms. Lately, Deep learning models progressed profoundly in the area of image processing. This success has been efficiently directed towards enhancements in sentiment categorization. A hybrid deep learning model consisting of Convolutional Neural Network (CNN) and stacked bidirectional Long Short Term Memory (BiLSTM) over pre-trained word vectors is proposed in this paper to achieve long-term sentiment analysis. This work experiments with various hyperparameters and optimization techniques to make the model get rid of overfitting and to achieve optimal performance. It has been validated on two standard sentiment datasets, Stanford Large Movie Review (IMDB) and Stanford Sentiment Treebank2 Dataset (SST2). It achieves a competitive advantage over other models like CNN, LSTM and ensemble of CNN-LSTM by attaining better accuracy and also produces high F measure.

Keywords:

Sentiment Analysis, Deep Learning, Word2vec, CNN, BiLSTM, IMDB, SST2.

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