



KHACDD: a knowledge-based hybrid method for multilabel sentiment analysis on complex sentences using attentive capsule and dual structured recurrent network

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Abstract

Using a machine to mine public opinion saves money and time. Traditional sentiment analysis approaches are typically unable to handle multi-meaning phrases, syntactically complex structured statements, and a large number of characteristics. We proposed a new knowledge-based hybrid deep learning method (KHACDD) for sentiment classification that integrates a hierarchical attention-based capsule infrastructure with both the dual along with bidirectional recurrent neural network (RNN), Dilated convolutional neural network (CNN), and domain-based knowledge to fix these problems. Our innovative hybrid approach enhances the structure of feature representation as well as feature extraction as well as sentiment classification by dynamically routing capsules its hierarchy structure toward an attention capsule. The suggested hybrid neural network model is based on modified capsules and therefore can learn implicit semantics effectively. The BiGRU-BiLSTM is used all through this system to achieve proper long-distance and interdependent contextual information functioning. In addition, the capsule network may be capable of extracting rich textual information in order to improve express ability. GloVe embedding is used before the RNN layer to incorporate local context into global statistics. To improve performance, the proposed technique leveraged domain-specific information to handle misclassification. Adding adaptive domain-specific knowledge produces a margin of roughly 1% for multilabel ER(Emotion Recognition) social media data as well as 4% for multifeatured and multilabel MHER(Mental Health Emotion Recognition) clinical data, according to the experimental results. In the future, we will improve our model to handle more classes of sentiment with less complexity.

Keywords BiLSTM-Bi-GRU · Dilated CNN · Sentiment analysis · Capsule network · Knowledge · Attention

1 Introduction

Social media is a popular tool for exchanging news and opinions. It is regarded as one of the most important resources for determining users' attitudes regarding certain items or issues/topics. The influence of social networking on individuals has grown exponentially as its breadth has expanded. Many businesses profit from the engagement of social media in order to grow this market segment. The goal is to discover and comprehend the feelings regarding any linked problem in social media (emotions, feelings, views). Methods for emotion interpretation reveal how you're experiencing. By analyzing emotions, consumers can have a better understanding of social networks and responses [1, 19]. In recent years, feelings, point of view

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