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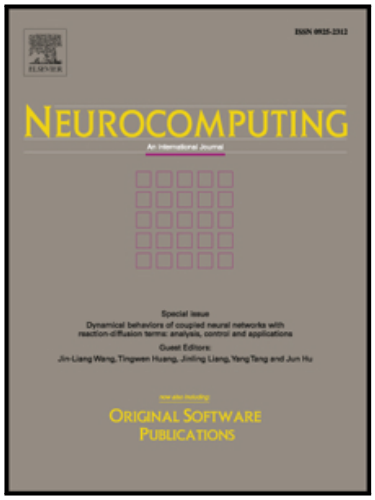

Textual sentiment analysis via three different attention convolutional neural networks and cross-modality consistent regression

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Textual sentiment analysis via three different attention convolutional neural networks and cross-modality consistent regression

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Abstract

Word embeddings and CNN (Convolutional Neural Networks) architecture are crucial ingredients of sentiment analysis. However, sentiment and lexicon embeddings are rarely used and CNN is incompetent to capture global features of sentence. To this end, semantic embeddings, sentiment embeddings and lexicon embeddings are applied for texts encoding, and three different attentions including attention vector, LSTM (Long Short Term Memory) attention and attentive pooling are integrated with CNN model in this paper. Additionally, a word and its context are explored to disambiguate the meaning of the word for rich input representation. To improve the performance of three different attention CNN models, CCR (Cross-modality Consistent Regression) and transfer learning are presented. It is worth noticing that CCR and transfer learning are used in textual sentiment analysis for the first time. Finally, some experiments on two different datasets demonstrate that the proposed attention CNN models achieve the best or the next-best results against the existing state-of-the-art models.

Keywords: Textual sentiment analysis, Word embedding, Lexicon embedding, Attention mechanism, Cross-modality consistent regression

1. Introduction

Recent years have witnessed the rapid development of information technology and revolutionary transformation of social media. For example, websites such as Facebook, Twitter, Flickr, Weibo, IMDB (Internet Movie Database), where people can show their sentiments or emotions by uploading text, pictures or videos, have been growing popular. Meanwhile, a large number of user data, which are widely applied in public opinion analysis and product

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