Undergraduate Research Report

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Title	Rating Prediction by Considering Relations among Documents and Sentences and among Categories		

Sentiment classification of product reviews are important to analyze sentiment of them for marketing in companies.

Nowadays, on sentiment classification problem, some methods using neural network are proposed and work better than previous methods. Neural network is capable to extract and utilize complex relations among factors in input features for sentiment classification. However, they are usually for binary or multi-class classification on one category.

As a method to learn semantic representations of large language expressions, such as documents, paragraphs, and sentences, the Distributed Memory model of Paragraph Vectors (PV-DM) is proposed and shows good performance on sentiment classification while it ignores order of sentences in the classification step.

This research aims to propose a method of sentiment classification on multiples categories which considers relations among its text, its sentences and categories and improves classification accuracy better than present methods.

The proposed method classifies reviews in 2 steps. First, it generates distributed representations of reviews and sentences in them using PV-DM. Second, it classifies reviews by them to classes of ratings on labels of categories using the fully-connected neural network as sentence vectors in each review are compressed into an weighted average of them. At the second step, the relations of text and sentences in a review and categories are considered to classify it.

In the experiments, And, from the result that the proposed method indicated better accuracy than the comparative methods and the present method specialized for sentiment classification on multiple categories, it is found out that the order of sentences in a review is important for sentiment classification and PV-DM captures some sort of different features them applied to a whole document and sentences in a review.