Product Aspect and Sentiment Analysis without using Parsers

CS671, Project Proposal, Group:M

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1 Introduction & Motivation

When shopping online, we often look at what other people, who have already used the product, have to say, i.e we look at their reviews, but the sheer number of reviews makes it difficult to browse through all of them and properly gauge the overall sentiment. Although most of these sites do provide a star based rating system, it provides a very coarse view and does not really speak about the product aspects. What we plan to do here is to summarize reviews of the products without using a parser so that the idea can be extended across various languages. Our motive is to find out the products' aspects from the test dataset and then do sentiment analysis on it, to find out an overall review of the product based on the features extracted.

2 Related Work

A lot of work, with different levels of granularity, in field of aspect based sentiment analysis has been proposed(see [2], [3] and [4]), each one having its own advantages and disadvantages. But so far all such works are based on usage of parsers to preprocess the input, here we propose to use a method that does not use any parser and is independent of any specific language structure.

3 Our Approach

Our approach is based on the paper by Zhou et al. for Semantic Role Labeling Using Recurrent Neural Networks [1]. This paper uses a deep bi-directional LSTM based neural network to find semantic labels without using a parser of any sort to pre-process the input.

We propose using a similar model for labeling the words as aspects or non-aspects. Specifically, we will use an aspect tagged review dataset to train our deep BD-LSTM network to identify aspects and non-aspects. Then we will use it on the test dataset to find out product features. Following this, we will use aspect based sentiment analysis to figure out the sentiment of the reviews and finally summarize them in a proper manner. Our main focus is aspect extraction without a parser.

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4 Dataset

We will be using the dataset on Prof. Bing Liu's page, and also the dataset provided here :
http://curtis.ml.cmu.edu/w/courses/index.php/Amazon_product_reviews_dataset

References

[1] Zhou, Jie and Xu, Wei. "End-to-end Learning of Semantic Role Labeling Using Recurrent Neural Networks" (2015)

[2] Poria, Cambria, Wei Ku et al. "A Rule-Based Approach to Aspect Extraction from Product Reviews" (2014)

[3] Pavlopoulos & Androutsopoulos. "Aspect Term Extraction for Sentiment Analysis: New Datasets, New Evaluation Measures and an Improved Unsupervised Method" (2014)

[4] Minqing Hu and Bing Liu. "Mining and summarizing customer reviews" (2004)