A Study on Fundamental and Techniques of Sentiment Analysis

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Abstract:

Sentiment Analysis (SA) or Opinion Mining (OM) is the computational study of people's opinions, attitudes and emotions toward an entity. The Sentiment Analysis tool is to function on a series of expressions for a given item based on the quality and features. Sentiment analysis is also called Opinion mining due to the significant volume of opinion. These sentiments become very beneficial for businesses, governments, and individuals. This paper focuses on the various methods used for classifying a given piece of text according to the opinions expressed in it i.e. whether the general attitude is negative, positive and neutral and techniques of sentiment analysis.

Keywords: Sentiment Analysis , Opinion Mining,Polarity

1. Introduction

Sentiment analysis is the process of detecting the contextual polarity of the text. It determines whether given text is positive, negative or neutral. It is otherwise called as opinion mining too, since it derives the opinion or attitude of the speaker. The demand of sentiment analysis is raised due to increase requirement of analyzing and structuring hidden information which comes from the social media in the form of unstructured data.

1.1 Levels of Analysis:

In general, sentiment analysis has been investigated mainly at three levels [1]. In document level the main task is to classify whether a whole opinion document expresses a positive or negative sentiment. This level of analysis assumes that each document expresses opinions on a single entity. In sentence level the main task is to check whether each sentence expressed a positive, negative, or neutral opinion. This level of analysis is closely related to subjectivity classification, which distinguishes objective sentences that express factual information from subjective sentences that express subjective views and opinion. Document level and the sentence level analyses do not discover what exactly people liked and did not like. Aspect level performs finer-grained analysis. Instead of looking at language constructs (documents, paragraphs, sentences, clauses or phrases), aspect level directly looks at the opinion itself.

2. Literature Review

G.Vinodhini et al [3] proposed an Overview of different opinion mining techniques. Dr.Ritu Sindhu et al [4] presented different levels of analysis and issues in sentiment analysis. Bo Pang [5] gave a new machine learning method that determines sentiment polarity. Alec Go [6] proposed a novel approach to classify sentiment of the twitter message automatically and showed that machine learning algorithms (Naive Bayes, Maximum Entropy, and SVM) have accuracies above 80% when trained with emoticon data.

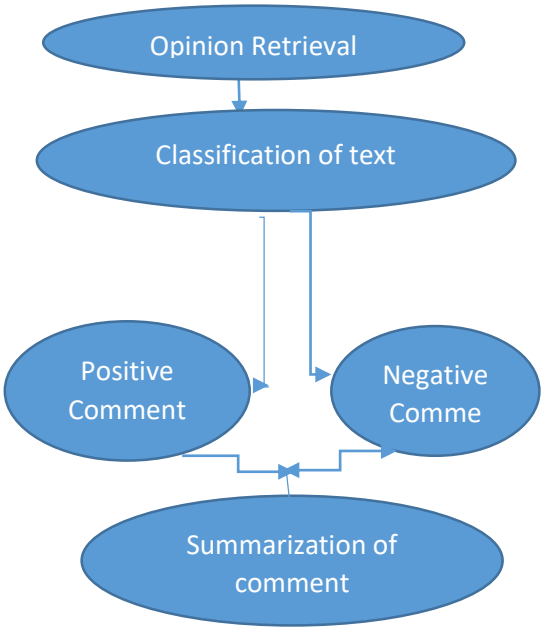
3. Data Source

Data from sources mentioned below are used to locate opinions and ensure good recommendation for specific applications. Most common sources are blogs and review sites.

4. Standard Structure of Sentimental Analysis

Opinion mining and summarization process involve three primary steps, first is Opinion Retrieval, Opinion Classification and Opinion Summarization. Review Text is retrieved from review websites. Opinion text in blog, reviews, comments, etc. contains subjective information about the topic. Reviews classified as positive or negative

review. Opinion summary is generated based on features opinion sentences by considering frequent features about a matter.



Architectiure of Sentiment Analysis

4.1 Opinion Retrieval: It is the procedure of collecting review text from review sites. Different review websites contain reviews for products, movies, hotels and news.

4.2 **Information retrieval: Techniques** such as web crawler can be employed to collect the review text data from many sources and store them in a database. This step involves retrieval of reviews, micro-blogs and comments by user.

4.3 **Opinion Classification:** Primary steps in sentiment analysis are a classification of review text. Given a review document M = {M1….. M1} and a predefined category set K = {positive, negative}, sentiment classification is to classify each day in M, with a label expressed in K. The approach involves classifying review text into two forms namely positive and negative [7]. Machine learning and dictionary based approach is more popular [8].

4.4 **Opinion Summarization :** Summarization of opinion is a major character in the opinion mining process. Summary of reviews provided should be based on features or subtopics that are mentioned in the reviews. Many works have been done on summarization of product reviews [7].

5.Techniques for Sentiment Analysis:

Sentiment analysis relies on two types of techniques, i.e., lexicon based and machine learning based techniques [9].

a)Machine learning based techniques: This type of techniques are implemented by extracting the sentences and aspect levels. The features consist of Parts of Speech (POS) tags, n-grams, bi-grams, uni-grams and bag-of-words. Machine learning contains three flavours at sentence and aspect, i.e., Nave Bayes, Support Vector Machine (SVM) and Maximum Entropy.

b) Lexicon based or corpus based techniques: These techniques are based on decision trees such as k-Nearest Neighbours (k-NN), Conditional Random Field (CRF), Hidden Markov Model (HMM), Single Dimensional Classification (SDC) and Sequential Minimal Optimization (SMO), related to methodologies of sentiment classification.

Machine learning approach has three categories: i) supervised;
ii) semi supervised; and iii) unsupervised. This approach is capable of automation and can handle huge amount of data therefore these are very suitable for sentiment analysis.[10].

6. CONCLUSION

Sentiment Analysis is one of the important research areas as it summarizes opinions and reviews of public. This study highlights the main idea behind Sentiment Analysis and explains literature review, Sentiment Classification, in detail. Sentiment analysis is one of the active research areas and several interesting works have been done in this field. Sentiment analysis helps in decision making and knowing people review by analyzing or giving rating to their views such as product reviews.

7. REFERENCES

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