Chapter 1
Approaches and Applications for Sentiment Analysis:
A Literature Review

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ABSTRACT

With the increasing penetration of the internet, an ever-growing number of people are voicing their opinions in the numerous blogs, tweets, forums, social networking, and consumer review websites. Each such opinion has a sentiment (positive, negative, or neutral) associated with it. But the problem is that the amount of data is simply overwhelming. Methods like supervised machine learning and lexical-based approaches are available for measuring sentiments that have a huge volume of opinionated data recorded in digital form for analysis. Sentiment analysis has been used in several applications including analysis of the repercussions of events in social networks, analysis of opinions about products and services. This chapter presents sentiment analysis applications and challenges with their approaches and tools. The techniques and applications discussed in this chapter will provide a clear-cut idea to the sentiment analysis researchers to carry out their work in this field.

INTRODUCTION

Sentiment analysis is the automated mining of attitudes, opinions, and emotions from text, speech, and database sources through Natural Language Processing. The sentiment or opinion expressed emotions are classified in different classes as positive, negative and neutral. The basic task of sentiment analysis is to classify the

polarity in different levels like Document level, Sentence level and Aspect level or entity level. In document level the whole document is classify either into positive or negative class. Sentence level sentiment classification classifies sentence into positive, negative or neutral class. Aspect or entity level sentiment classification concerns with identifying and extracting product features from the source data. The sentiment classification approaches can be classified in: (i) machine learning (ii) lexicon based and (iii) hybrid approach. The machine learning approach is used for predicting the polarity of sentiments based on trained as well as test data sets. While the lexicon based approach does not need any prior training in order to mine the data. It uses a predefined list of words, where each word is associated with a specific sentiment. Finally in the hybrid approach, the combination of both the machine learning and the lexicon based approaches has the potential to improve the sentiment classification performance. On considering the tools used for sentiments analysis, the most used tools for detecting the feelings polarity are Emoticons, LIWC, SentiStrengh, Senti WordNet, SenticNet, Happiness Index, AFINN, PANAS-t, Sentiment140, NRC, EWGA and FRN. Sentiment analysis is used mainly in different fields such as marketing, political and sociological. This chapter presents sentiment analysis applications and challenges with their approaches and tools. The techniques and applications discussed in this chapter will provide a clear cut idea to the sentiment analysis researchers to carry out their work in this field. The rest of the chapter is organized as follows: the background section describes the related work. A brief description of sentiment analysis, levels, applications and challenges with their approaches and tools of sentiment analysis is presented in section of main focus of the chapter. Finally, the chapter concludes with future research directions.

BACKGROUND

Vishal A Kharde et al., (2016) provide a survey and comparative analyses of existing techniques for opinion mining like machine learning and lexicon-based approaches, together with evaluation metrics. Megha Joshi et al., (2017) describe different applications of sentiment analysis, techniques and challenges of sentiment analysis. Shamsa Umar et al., (2018) have discussed different researcher's work on sentimental analysis approach and classification. This paper also presents the importance of opinion mining and sentiment analysis. Lin Yue et al., (2019) focus on presenting typical methods from three different perspectives (task-oriented, granularity-oriented, methodology-oriented) in the area of sentiment analysis. Specifically, a large quantity of techniques and methods are categorized and compared. On the other hand, different types of data and advanced tools for research are introduced, as well as their limitations. On the basis of these materials, the essential prospects

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