Chapter 6
Analysis of Online Social Networks for the Identification of Sarcasm

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ABSTRACT

With the ever-increasing acceptance of online social networks (OSNs), a new dimension has evolved for communication amongst humans. OSNs have given us the opportunity to monitor and mine the opinions of a large number of online active populations in real time. Many diverse approaches have been proposed, various datasets have been generated, but there is a need of collective understanding of this area. Researchers are working around the globe to find a pattern to judge the mood of the user; the still serious problem of detection of irony and sarcasm in textual data poses a threat to the accuracy of the techniques evolved till date. This chapter aims to help the reader to think and learn more clearly about the aspects of sentiment analysis, social network analysis, and detection of irony or sarcasm in textual data generated via online social networks. It argues and discusses various techniques and solutions available in literature currently. In the end, the chapter provides some answers to the open-ended question and future research directions related to the analysis of textual data.

1. INTRODUCTION

It is always fascinating to know "What going on the other person's mind", and it has been an important part of the information for most of us while taking any decision or collaborating. Before the internet revolution, we used to ask our friends about their take on any topic, thing, or person. They were the people whose opinions and experience helped us taking our decision wisely and make maximum out of it. With the internet penetrating into our lives along with many applications and technologies, we are now connected with a vast pool of people who are not our friends or acquaintances neither they are known to us; also they are not the experts or professional of that particular field. Still, the opinion and

sentiment they have are important to us and helps us to take the decision. It is also true the other way around, that more and more people are making their opinions available to strangers with the help of the internet. Thus, evolves a field of science known as sentiment analysis, also known as *opinion mining*.

1.1. Sentiment Analysis and Opinion Mining

Sentiment analysis is a field of study where we analyze people's opinions, sentiments, attitudes and emotions towards various topics and entities like products, services, events, issues, related attributes and much more. While academicians use sentiment analysis and opinion mining often, in the industry its only sentiment analysis. The word sentiment analysis was first used by Nasakawa in the year 2003, on the other hand, Dave et. al. (2003) used opinion mining for the very first time in the same year. Hence in broad terms, sentiment analysis and opinion mining focus on the views which eventually imply negative or positive polarity of sentence.

Although we have a very long history related to natural language processing and linguistics but very little has been explored and researched in the field before the arrival of the 21st century, after this the area has seen active research by academicians and industrialists. The major reason of this thrust is because of the applications it has in the various domains. Many commercial applications like Amazon, eBay are largely dependent on these applications that predict or judge the mood of the consumer and present it to the other user to follow. Also, this field offers many challenging problems which had never been addressed or evaluated before. But, the most important factor that propels the research in this field is a huge volume of opinionated data which is available for the very first time on the world wide web (WWW), on various social networks and many commercial sites. Without this, it would not have been possible to conduct research in the field. It can be said that sentiment analysis and opinion mining has a major impact on natural language processing apart from that, it plays important role in managerial science, economics, as all these are affected by opinions of other people.

1.2. Technology Background of Sentiment Analysis

Sentiments are central to almost every human being; activities related to them and have a large impact on the behavior of ours. With the rapid growth of online social media, we have ample of data in form of reviews, blogs, micro-blogging sites, comments, Twitter, Facebook and various other posting on OSNs that can be and should be used for the decision-making process. They have real-life applications and implications that help us in one way or the another. Apart from these applications, many researchers have published various application-oriented articles in the literature. Starting with McGlohon et. al. (2010) analyzed reviews that helped to rank the products and merchants selling them. Similarly, Liu in 2007 published a model to predict the sales performance. Twitter sentiment has been linked with multiple studies some tried to rate the movies so as to predict the box-office collection, others tried to predict the result of ongoing elections (O'Connor et al, 2010; Tumasjan et al, 2010; Yano et al, 2010; Asur et al, 2010; Joshi et al, 2010). Many studies also tried to find out the pattern in the stock market one such study is explained in (Bollen, 2011). While there are approaches proposed to calculate the trading strategies of any brokerage firm (Zhang, 2010). We are not only limited to this, people have tried to find out the social relation graph for various users in (Groh et al, 2011). Thus, we have many studies in the literature that prove to be useful and provide us multiple types of solutions and algorithms to work with.

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