

Chapter 60

An Approach to Opinion Mining in Community Graph Using Graph Mining Techniques

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ABSTRACT

Opinions are the central theme to almost all human activities, as well the key influencers of our behaviours. Opinions related to sentiments, evaluations, attitudes, and emotions are the features of studying of opinion mining. It is important to study peoples of various communities sentiments about the schemes implemented by the government agencies as well as NGOs. The opinion mining is about the opinions of various communities of villages of a Panchayat about various social schemes implemented by the government of India. This article proposes an algorithm for opinion mining in a community graph for various social schemes run by the Panchayat using graph mining techniques. The algorithm has been implemented in C++ programming language.

INTRODUCTION

Sentiment analysis is to study and analyzes people's attitudes, evaluations, and opinions for topics, services, individuals, issues, products, organizations, events, and etc. The other name of sentiment analysis is opinion mining. Some other alternate names with slightly different tasks are emotion analysis, subjectivity analysis, opinion mining, opinion extraction, review mining, sentiment analysis, sentiment mining, and affect analysis. However, the above all analysis comes under sentiment analysis or opinion mining. Sentiment analysis is commonly used in industry, whereas opinion mining and sentiment analysis are frequently used in academia according to the author (Bing Liu, 2012). Opinion mining attracts some selected groups of people. Generally, the government, the lawmakers, and politicians are interested in knowing the response of the special people to the government policies. Since opinion mining focuses

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on the features level mining. So, it is easy mine the commented features as well as the sentiment mining. These comments could be used to generate various types of opinion summaries as well as in depth analysis of general attitudes. Generally, most of the researches are interested in product features identification, opinions identification of the products, and determining the sentiment process of the opinions which comes under the feature level opinion mining.

LITERATURE REVIEW

Many companies create their opinion mining systems to automatically maintaining of review and opinion of websites. These systems gather a large volume of information from the web continuously. The gathered information's are review of products, brand value, and different political issues. Sometimes the opinion mining and sentiment analysis are used as sub-component technology to get into the depth of customer relationship management and recommendation systems through their feedbacks i.e. either positive or negative. Sometimes opinion mining and sentiment analysis are used to detect and exclude bias language in social communication proposed by the authors (Cambria, Schuller, Xia, & Havasi, 2013).

Opinion Mining mainly extracts the subjective statements from texts, which actually identifies the opinions, the orientation opinion and the extraction of actual arguments from the opinions. The authors (Helander, Lawrence, & Liu, 2007) represented an online discussion as a graph. The entities vertices are such as messages, users etc. and the edges among the entities are considered as relationships.

Social Network Analysis which analyze the relationships between the existing entities in a social network. So, in a social network, analysis of people may consist of detection of various friend groups, detection of influence group of people, and so on. For the social network analysis of people, the authors (Stavrianou, Velcin, & Chauchat, 2010) proposed a new framework for discussion analysis is the combination of Opinion Mining Techniques and Social Network Techniques. It studies the structure of online debate and analyzes all the user's reactions, preferences, and opinions related to a particular subject. The authors have proposed the model based on graph representation. Generally, in a graph representation, the users are considered as vertices of the graph. The authors have proposed message objects are the vertices in the graph. Similarly, the authors have represented a directed graph i.e. $G = (M, R)$ for the online discussions, where M is the message objects and R is the set of edges which shows the relationship between two message objects. Hence this graph is termed as opinion-based graph.

The authors (Fisher, Smith, & Welser, 2006) applied social network techniques to analyze newsgroups and interpret the members of the groups with the assigned roles. It was achieved by the way the people related to each other upon post reply relations in a graph-based model. The authors (Java, Song, Finin, & Tseng, 2007) analyzed the Twitter's social network. The authors have tried to know the intentions of the associated users and the reason of using such networks by the user. The authors have tried to identify the community formation. They categorized these community formations into three groups. These three groups are: information created by the communities, information received by the communities and communities which is responsible for creation of friendship. The authors (Scripps, Tan, & Esfahanian, 2007) introduced a new technique to define the number of communities to be attached to a node. Based on this, the authors have assigned the roles of nodes based upon the community structure.

The authors (Zhang, Xia, Meng, & Yu, 2009) proposed a graph with two sets i.e. F is the product features and W is the opinion words. Then a bi-partite link is created by using all the elements of F and O . Finally, a graph is defined as $G = (F, O, R)$, where, R is the weight of the link between product

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