

A combination of opinion mining and social network techniques for discussion analysis

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Abstract. Mining opinion data that reside in online discussions is a way to track opinions of people on specific subjects. Many of the existing techniques model a discussion as a social network of users and they represent it with a user-based graph. In this paper we propose a new framework for discussion analysis. We combine Social Network Analysis and Opinion Mining in order to give structure to a discussion. Such techniques have not been combined until now. We propose the use of an opinion-based graph whose vertices contain message objects and its «reply-to» edges are labeled with opinion polarities. We compare the opinion-based with the user-based graphs and we analyze the different information that can be extracted from them. Our experiments validate the proposed framework and show that the representation of discussions by opinion-based graphs gives information that cannot be provided by a user-based graph.

1 Introduction

The development of Web2.0 has resulted in the generation of a vast amount of blog repositories, review sites, web forums and online discussions. In this type of discussions people express opinions, criticize products and ideas, exchange knowledge and beliefs. Tracking opinions on specific subjects allows the identification of user expectations and needs, feelings of people about certain political decisions or reactions against particular events. As a result, mining and extracting opinion data that reside in online discussions becomes significant.

Opinion Mining is the field that deals with the mining of subjective statements from texts, the identification of opinions, the estimation of opinion orientation and the extraction of arguments that relate to opinions. Mining opinions in online discussions requires an appropriate representation.

An online discussion can be represented as a graph where the vertices are knowledge entities (users, messages etc.) and the edges between them show relationships. Hence, a discussion can be analyzed by techniques of the Social Network Analysis which is the mapping of relationships between people, organizations or other information/knowledge processing entities