

Chapter 40

A Classification Framework on Opinion Mining for Effective Recommendation Systems

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ABSTRACT

With the recent trend of expressing opinions on the social media platforms like Twitter, Blogs, Reviews etc., a large amount of data is available for the analysis in the form of opinion mining. This analysis plays pivotal role in providing recommendation for ecommerce products, services and social networks, forecasting market movements and competition among businesses, etc. The authors present a literature review about the different techniques and applications of this field. The primary techniques can be classified into Data Mining methods, Natural Language Processing (NLP) and Machine learning algorithms. A classification framework is designed to depict the three levels of opinion mining –document level, Sentence Level and Aspect Level along with the methods involved in it. A system can be recommended on the basis of content based and collaborative filtering

INTRODUCTION

People's opinions and sentiments of different entities can be analyzed using opinion mining. These entities can be classified into products, services, issues and different topics (Liu, 2012). It is an important research field of Natural Language Processing (NLP) and text classification. It involves both NLP and machine learning algorithms to extract the opinions from different available sources.

Some researchers stated that Opinion Mining and Sentiment Analysis (SA) have different notions (Tsytsarau, 2012). Opinion Mining is being derived from Information Retrieval (IR) field. It analyzes people's opinion about an entity. SA, on the other hand, falls under NLP that identifies the sentiment

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expressed in a text by analyzing it. However, we will use both the terms interchangeably because they both have mutual meanings.

Opinion forms the basis for people, organizations and social communities to take accurate and effective decisions. People mostly ask their friends, peers and knowledgeable persons about their opinion on an entity while taking the decision, since, they believe the experiences, observations, concepts and beliefs of other individuals will help them in boosting the decisiveness of that entity. The inception of expressing the opinions and views on these portals has become a huge trend due to the growth of social platforms in the form of reviews, blogs, twitter, etc. Due to this large volume of opinionated data is being loaded for analysis. Thus, opinion mining plays a pivotal role in extracting the positive or negative sentiments.

Document level, sentence level and Aspect or feature level are the three classification levels in opinion mining. (Medhat et al., 2014). SA has various applications in different fields of products and services and political elections. Apart from the popular applications, many other applications like twitter analysis and sales performance evaluation are also flourishing.

Recommender systems are designed to help the user in finding the most interesting and valuable information for them (Resnick & Varian, 1993). Content based filtering and collaborative filtering (CF) are the two types of recommendation systems. In content based filtering the Recommendation System(RS) maintains a user profile pertaining to the items user has liked before. A separate metadata pertaining to the all the items is separately maintained. The RS tries to find item having similar attributes to the user profile and predicts the likeable items for the user using the same. On the other hand, collaborative filtering selects items for users based on the similarity between the user and other users, eliminating the problem of overspecialization.

This paper presents a rigorous literature survey that contains a comprehensive overview of recent research trends, advances, and challenges in the field of opinion mining and Collaborative Filtering(CF). The goal of the study is to make students and researchers access to the latest works in this field by providing them ample of knowledge. In this survey, we have reviewed some fifty papers on opinion mining and Collaborative filtering in different applications and domains.

This paper has been classified into different sections. The research design of this paper will be elucidated in the section 2. The classification framework is presented in section 3. The classification of papers along different specifications is discussed in section 4. The analysis based on the classification of articles is discussed in section 5. The implication of research is shown in section 6 and in the final section, the conclusion is drawn by mentioning its immense possibility for further research.

LITERATURE REVIEW

A lot of authors have written about opinion mining in different papers. Some of the authors have used machine learning algorithms while some have incorporated Natural Language Processing (NLP) techniques. Turney (2002) performed the classification at document level using unsupervised machine learning technique. Liu (2012) implemented the classification of reviews at document level.

Zhang et al. (2011) classified reviews of restaurants using supervised machine learning techniques like Naïve Bayes and SVM (Support Vector Machines). Kang et al. (2011) classified the reviews based on traditional machine learning techniques. Tsytarou et al. (2011) focused on the subjectivity by classifying the sentence into objective and subjective.

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