

Chapter 31

Improving Collaborative Filtering Algorithms: Sentiment-based Approach in Social Network

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ABSTRACT

This paper puts forward a new recommendation algorithm based on semantic analysis as well as new measurements. Like Facebook, Social network is considered as one of the most well-prominent Web 2.0 applications and relevant services elaborating into functional ways for sharing opinions. Thereupon, social network web sites have since become valuable data sources for opinion mining. This paper proposes to introduce an external resource a sentiment from comments posted by users in order to anticipate recommendation and also to lessen the cold-start problem. The originality of the suggested approach means that posts are not merely characterized by an opinion score, but receive an opinion grade notion in the post instead. In general, the authors' approach has been implemented with Java and Lenskit framework. The study resulted in two real data sets, namely MovieLens and TripAdvisor, in which the authors have shown positive results. They compared their algorithm to SVD and Slope One algorithms. They have fulfilled an amelioration of 10% in precision and recall along with an improvement of 12% in RMSE and nDCG.

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INTRODUCTION

Nowadays, the continuous progress of data and communications technologies, the increasing use of digital technologies among the people and the development of the users' lifestyles and norms necessitate innovative types of systems. The success of these systems will rely upon their capability to operate as a unit, to supply services to their users in every place and at any moment as well as to accustom themselves to the changes surrounding their environments. Recommender systems help users to identify their interests and sets of choices by predicting the invalidity of an item or a group of items to these users. They are defined as a special type of information filtering that provide information about which items may be interesting to users. Recommender systems generate a personalized recommendation for users based on a set of previously rating items. However, according to (Baldoni et al., 2011) the social web principles, social network and platforms promote the participation of users in many ways, stimulating the expression of opinions about the contents inserted by other users, by 'Like', 'Share' annotations, star-rating systems... This huge amount of data is a precious information source about perceptions, trends and feelings, and a lot of research is being carried on to identify ways for extracting meaningful information from these data. In fact, the social network could be considered an important source of recommendation. This paper endeavors to combine two types of information respectively called social and semantic information. The main purpose is to compute recommendation lists through making a visit to a limited part of social network.

We have improved the Slope One and SVD algorithms by external knowledge and through some experiment results. The approach has been applied in Java and tested on the MovieLens and TripAdvisor data sets. The results demonstrate that the additional knowledge achieved by the semantic analysis contributes to the amelioration of the quality recommendation in terms of accuracy.

Hence, this study foregrounds two major issues. The first part seeks to gather as well as parse data, while the second one attempts to use external resources to come up with relevant suggestions.

We construct this paper as following: We start with some major research literature on recommendation systems. Next, we highlight our approach via applying user's sentiment in order to raise the value of recommendation algorithm. We clarify the experiment immediately followed by an estimation of our algorithm. In conclusion, we briefly summarize our proposed study providing a few remarks on future works.

EASE OF USE

According to Burke (Burke, 2002), Recommender systems have three fundamental categories: collaborative-filtering, content-based and hybrid. The hybrid recommender system combines the content-based and the collaborative-filtering regarding the kind of advocated data Recommendation types are explained in details with their limitations in this section:

- **Content-based:** It advocates items that are akin to those the users selected on time before (Adomavicius & Tuzhilin, 2005; Burke, 2002). Items like products, services or even people are identified by their related characteristics. User's favorite choices, which are preserved in the user's profile and taking into account those associated criteria, emerge in already estimated items. According to (Schafer et al., 1999) content-based technique is termed item-to-item affinity. We show some usual research on which these traits are revolved around this technique, which are:

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