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Semantic-based Followee Recommendations on Twitter Network

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Abstract

Twitter bloggers use the concept of follower/followee in order to inform and to be informed of all recent activities of users who have similar interests and preferences. Moreover, finding relevant users to follow becomes a crucial task due to the rapid growth of Twitter network and the huge number of daily registered users. Thus, the need for a system to assist users in such task is very important. Indeed, recent studies use lexical analysis to recommend people to follow. In this paper, we propose a followee recommender system based on semantic analysis of user profiles content by leveraging the follower/followee topology. We perform experiments using a real dataset harvested from Twitter. Experimental results show that our approach improves lexical-based approach by more than 5% on recall value for recommending 5 followees, proving that dealing with semantic gap in microblogging content is more relevant for the quality of recommending like-minded users.

1. Introduction

Nowadays, Twitter micro-blogging service is the most popular microblogging service gaining more and more users, this service allows his users to post short messages known as tweets, also to repost someone else's tweets, with the aim of sharing this tweet with his/her followees, unlike other social networks, Twitter caught the attention of users by its real-time spreading of information.

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The tweets in Twitter are text based post of up to 140 characters displayed on users profiles and delivered to the users followers, those users publish information about their subjects of interest and topics, also they may be looking for new information which match their interests, so we talk about following users who are interested in the same topics as them, at this stage it is important to propose effective recommender systems to assist users in choosing their followees. Twitter has already added a "who to follow" recommender system[b] but it is not sufficient since it is based only on the topology follower/followee (it suggests people that follow the user followees), unlike other works which focus on ranking users according to their influence in the entire Twitter network [1] [2]. In this work, our aim is to provide a followee recommender system by focusing on followers/followees network graph of the target user and analyzing semantically the content of those followers/followees profiles.

This paper is organized as follows. Section 2 discusses related work. In section 3, we describe our semantic-based approach for followee recommendations. Experiments results are shown and discussed in section 4. Finally, Section 5 presents our conclusion and future work.

2. Related Work

Suggestion of relevant information for a user from microblogging service has attracted the attention of researchers over years [1], many followee recommender systems have been provided, we focused on recommending like-minded people to follow. In this context M.G Armentado et al. [3], proposed a followee recommender system based both on lexical analysis of the content of microblogs to detect user's interests, and on the topology of the network to find candidate users for recommendation. M. Fernando et al. [4] proposes a followee recommender system based on fuzzy logic which handles recommendations as a link prediction problem.

Each recommender system needs to collect information about users, Won-Jo Lee et al. [5] extract important key words from tweets and retweets to build a personal user profile. Other strategy was studied by Chunliang Lu et al. [6], in which they re-ranks tweets in users time-line, and measure the relevance between a tweet and user interest. The interest profile was presented as concepts from Wikipedia.

Many strategies exist for modeling user profiles, Ricado et al. [7] proposed an approach to construct user profiles based on user ratings on the news article. Guangyuan et al. [8] proposed to extract synsets from WordNet and concepts from DBpedia to represent user interests. Semantic analysis of microblogging text has gained a great attention recently in many microblogs information retrieval tasks, which have shown to be useful to deal with semantic gap and the high context in such form of communication [10][11][12]][13].

Our approach can be considered as an extension of M.G Amentado et al. [3], instead of analyzing microblogs textual content lexically, we used semantic analysis to process users' textual content.

3. Our approach

The followee recommender system in Twitter aims to help users searching for information, and consists on identifying source users posting important tweets for a target user, so he/she can follow those source users and receive real-time information in streaming from them. In this section, we provide all details about our followee recommender system. In the overall, it consists of three main steps. First it extracts the followers/followees network graph of the target user to select candidate users to be evaluated for recommending. Secondly it applies a normalization process of the profile contents, then it uses a profiling strategy to deduce the target and the candidate users' interests. The last step performs a semantic comparison between the target profile and the other ones in order to recommend a list of source users to be followed by the target user.

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[b] http://twitter.com/who_to_follow.