International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2013): 6.14 | Impact Factor (2013): 4.438

Trust Checking in Social Networks Using Data Mining

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Abstract: ***Now social network analysis gained many interest because of the large popularity of social media, social networking applications, blogs, or customer review sites. It mainly checks trust (and distrust) between people who belong to communities in social networks. In social networks, trust is an essential quality between the user interactions and the recommendation for trustful content and users. This particular system is based on a reputation mechanism that rates the participants using previous experiences, observations, and other member's opinion. In this paper, a collaborative reputation mechanism is used that collects and checks the user's connections and capitalizes on trust propagation. Here it point out that this system can be applied to any type of social network.***

Keywords: Personalization, Reputation, Recommendation, Social networks, Trust**.**

1. Introduction

A social networking service (also social networking site or SNS) is a platform to build social networks or social relation among people who share their interests, backgrounds, activities, or real-life connections. A social network service mainly consists of a representation of each and every user, his or her social links, and a variety of services in additonal. This social network sites are web based services that allows individuals to create their public profile, a list of users with whom to share their connections, and view and cross the connections within the system. The problem of user recommendations in social networks, initially formulated as a link prediction problem, has recently gained a lot of momentum. Now there is no efficient way to trust on social networking. The problem of user recommendations in social networks, initially formulated as a link prediction problem has recently gained a lot of momentum. There are several algorithms, based on different combinations of content similarity, social link information, and common items (eg: common publications) among users in order to recommend new friends to the users of a social network.

This paper proposes a trust-aware system for personalized user recommendations in social networks. Contrary to the initial works on user recommender systems for social networks that do not incorporate trust. More specifically the proposed system provides users with personalized positive and negative recommendations that can be used to establish new trust/distrust connections in the social network. The element of trust among users are not interoperated, and the proposed model is only applicable to social networking applications and not other social media. A social network can be viewed as a complex inter connection of social entities. The mining a community is the task of grouping these social entities together on the basis of their linked pattern. A lot of researches has been done on this subject but most of them were only concerned with the unsigned graph. This proposes a trust-aware system for member recommendations in social network. Trust in general is a multifaceted concept: it is subjective and non symmetric dynamic and context-specific, while it is often defined as the belief of an entity in the benevolence of another entity to act honestly and reliably in against to distrust.

2. Related Work

The largest body of this work involving positive trust and/or trust propagation in the context of recommender systems has mainly focused on item recommendations. The notion of trust propagation through transitivity is employed, and similarly to this paper. This paper touches all the aforementioned areas of research, yet is novel in several ways. The focus is on personalized user recommendations give both positive and negative trust relationships. The trust of a user to another user is based on a personalized reputation rating, which qualifies explicit connections among users (eg., friendship, trust or distrust) and implicit connections inferred from the interactions among users(eg., comments, like and dislike statements etc). In addition, this model supports trust propagation through explicit user connection in this social network. Our proposed model is a generic one, so we can use this mechanism in any type of social network applications. It posit that recommendation has an inherently social element and is ultimately concerned with connecting people either directly as a result of explicit user modeling or indirectly through the discovery of relationships implicit in existing data[2]. The below figure1 shows the formation of social networks in both explicitly and implicitly [2].

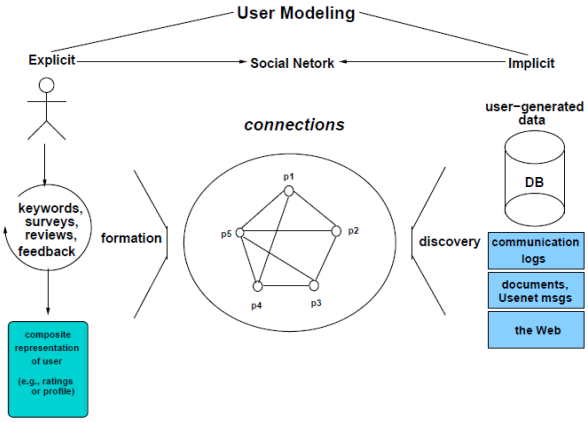

Figure 1: view of recommendation, (left) Explicit formation of a social network, (right) Implicit identification of a

network

3. Recommender System

To establish trust in a social networking sites, here I propose a mechanism called Reputation Mechanism. In this type of mechanism it mainly checks the activities in social networking sites .If I get a request in my FaceBook account, I don't have any sufficient method to check whether the person is trustful or not. So my mechanism is really useful in this case, means here it give a recommendation. With the help of this mechanism you can give trust to any social networking sites. .My system differentiates between explicit trust/distrust bonds amongst users that carry strong trust semantics and implicit trust statements that form more transient user connections in the network. In this mechanism, the first phase is user connection detection. In this phase all the activities of social networking sites are checked on the basis of the likes and comments give to a user by another user. The second phase is rating of the trust, here the trust is calculating by getting data from the first phase.

The trust is calculating by two mechanism that are,.
a) Local Rating
b) collaborating Rating

Let us assume the presence of N users $U = \{u1, u2, ..., uN\}$ in a social network. Every member $uj \in U$, publishes several content items while in the network. Additionally, $F(uj)$ and $E(uj)$ denote the friend list and the enemy list maintained by user uj , respectively.

1) Local Rating

This model assumes that the local rating estimation takes place at consecutive, equally distributed time intervals denoted henceforth as tk, $k \in$ N.The user reputation rating $Rating(u_j \rightarrow u_i, t_k)$ of u_i from u_j at time period t_k is given by the following formula:

$$Rating(u_j \rightarrow u_i, t_k) = w_{user} \cdot UserConn(u_j \rightarrow u_i, t_k) + w_{expl} \cdot ExplConn(u_j \rightarrow u_i, t_k) + w_{impl} \cdot ImplConn(u_j \rightarrow u_i, t_k) \quad (1)$$

where $w_{user} + w_{expl} + w_{impl} = 1$.
The second factor $ExplConn(uj \rightarrow ui, tk)$ corresponds to the explicit user-to-item connections as expressed by comments of user uj to content items published by ui at time period tk.

$$ExplConn(u_j \rightarrow u_i, t_k) = PosExpl(u_j \rightarrow u_i, t_k) - NegExpl(u_j \rightarrow u_i, t_k) \quad PosExpl(u_j, t_k) + NegExpl(u_j, t_k) \quad (2)$$

where $PosExpl(u_j \rightarrow u_i, t_k)$ and $NegExpl(u_j \rightarrow u_i, t_k)$ denote the number of positive user-to-item and negative user-to-item explicit opinions, respectively (i.e., like and dislike) as expressed by user uj , at time period tk, on the content items published by user ui, and $PosExpl(uj, tk)+NegExpl(uj, tk)$ denotes the total number of opinions expressed by user uj in time period tk on any published content item.

$$ImplConn(uj \rightarrow ui, tk) = PosImpl(uj \rightarrow ui, tk) - NegImpl(uk \rightarrow ui, tk) \quad PosImpl(uj, tk) + NegImpl(uj, tk)$$

The local rating is calculated by

$$LocalRating(u_j \rightarrow u_i, t_c) = \sum_{\substack{k=c-r+1 \\ k>0}}^{c} df_k \cdot Rating(u_j \rightarrow u_i, t_k) \quad [1]$$

i. Collaborative Rating

The overall collaborative rating $CollRating(u_j \rightarrow u_i, t_c)$ of target user u_i is estimated by the evaluator user u_j at the current time period t_c using the following formula:

$$CollRating(u_j \rightarrow u_i, t_c) = cred(u_j \rightarrow u_j, t_c) \cdot LocalRating(u_j \rightarrow u_i, t_c) + \sum_{\substack{q=1 \\ q \neq i,j}}^{Q} cred(u_j \rightarrow u_q, t_c) \cdot LocalRating(u_q \rightarrow u_i, t_c). \quad \textbf{[1]}$$

By these equations trust can be calculated**.** The value will lies between -1 and 1.If the trust value is below zero then the person is not a trustful person, if it is greater than zero, the person is a trust one. This is not an accurate decision ,it is only a recommendation, either you can accept by adding them to your friends list, or can be rejected as enemy.

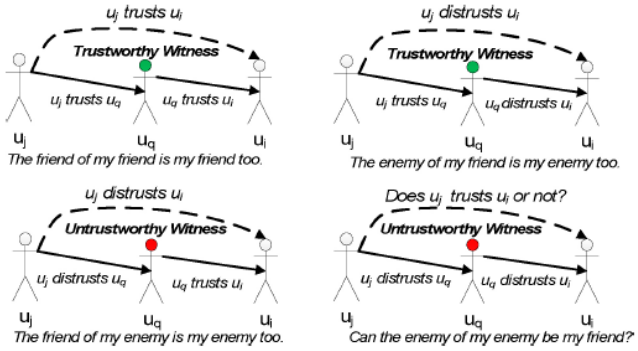

Figure 2: Checking of transitivity

The above figure give the overall architecture of thus reputation mechanism. This gives an explanation that are, (1)the friend of my friend is also my friend,(2)the enemy of my friend is also my enemy,(3) my friend's enemy is my enemy also,(4) it is good to make my enemy's enemy as my friend. Based on these theories the entire mechanism is work. The conversion of human facebook comments to binary data is done by a technique called NLP (Natural Language Processing) technique. It gives values 1 and 0, by putting these equations on the local and collaborative rating equations, it can calculate the trust value.

4. Conclusion

This paper presented a trust-aware system for generating personalized user recommendations in social networks. The foundations lie on a reputation mechanism that is mathematically formulated, comprising both local and collaborative rating formation[1]. Our system exploited two special features of social networks:

1) the difference between explicit trust statements, which carry stronger trust syntax and semantics, and implicit trust statements also, which represent a more transient reference to another network member; and
2) the timestamp information of a connection between users, either implicit or explicit. Moreover, the model was able to

handle negative trust (distrust) statements and supported transitivity of trust under conditions.

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