



Community Recommendation in Social Network Using Quasi-Clique Approach

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Abstract—

A social networking service is a platform to build relations among people who share interests, activities, backgrounds or real-life connections. Communities in a social network are the gathering places for the people with common interest. Social network analysis is in high demand now a days for the increasing number of users. They involve themselves into different communities. They share post, their views, what they like etc. in communities. So it is important for them to find suitable communities where they have common factors like friends, followers and their activities etc. In this paper, we propose a technique for recommending a community in social network like Facebook, Twitter etc. Finding strong friends from a user's friend list and using clique and quasi-clique concepts introduced in graph mining, we recommend suitable communities for a user in a social network.

Keywords—Text mining; User area of interest; Quasi-clique; Community Recommendation;

I. INTRODUCTION

A social networking phenomenon recently has its presence felt across the globe. It makes social meetings, interactions across the people communicate, employees easy. The interactions over social media resulted in huge amount of data that became a goldmine for researchers to have various mining operations to bring about knowledge and business intelligence. The fast growth and exponential use of social digital media has led to an increase in acceptance of social networks and the emergence of social computing. In general social networks are structures made of social entities that are linked by some specific types of interdependency. Recommendation system like social graph generation & forecasting using social network mining, finding strong groups of friends, finding popular friends in social network

are well known. I develop a recommendation system for user's communities. Day by day community is growing with the fast progress of social users. Nowadays we see the vast activity of social life. All those community can't be suitable for a particular social user. So recommendation system will find suitable community for a user. Social network analysis is in high demand now a day for the increasing number of users. They involve themselves into different communities. They share post, their views, what they like etc. in communities. For example, a social user has created a new profile in social network service. He or she has some common interests with some strangers or his/her friend. So they can create a community where being friend is not important but sharing the common interest is important. So it is essential for them to find suitable communities where they have common factors like friends, followers and their activities etc. Suppose a Hockey player always like to join in such groups which are involved with Hockey. He must have some friends in his friend list who are interested in playing Hockey. I then find those friends who are connected with some community associated with Hockey. Recommendation system will then recommend the user a suitable community based on detecting his strong friends and quasi-clique techniques.

II. RELATED WORK

A. Friend book: A Semantic-based Friend Recommendation System for Social Networks

The main Aim of this paper is to recommend friends to user based on their life style instead of social graphs. System Architecture of friend book adopts a client-server mode where each client is a smart phone and servers are data centers or clouds. To achieve this they are using impact ranking algorithm and friend recommendation algorithm. Friend book also uses GPS location information to help users find friends within some distance. They implemented friend book on the Android – based smart phones and evaluates its



performance on both small scale experiments and large scale simulations.

B. Finding Popular Friends in Social Networks

In this paper they are using data mining approach/algorithm to find popular friends in social networks to achieve this first they build the tree (p-tree), this p-tree is used to capture the necessary information. This p-growth algorithm first constructs a prefix. Tree based on the structure and then this algorithm recursively mines the p-tree to discover groups of popular friends. But this approach contains some drawback like the notion of popularity does not satisfy the down ward closure property they managed this issue by using accumulated list length together with projected lists which allow lazy pruning. Experimental results showed that p-tree is compact and space-efficient for both sparse and dense datasets. The main advantage of p-tree is time-efficient.

III. DATA MINING TECHNIQUES

Data mining is the process of automatically discovering useful information in large data repositories. Data mining techniques are deployed to search large databases in order to find novel and useful patterns that might otherwise remain unknown.

A. Text mining

Text mining, is also defined as text data mining, it is equivalent to text analytics, refers to the method of deriving high-quality information from text. Text mining usually includes the process of structuring the input text, deriving patterns inside the structured data, and finally estimate and interpretation of the output. Typical text mining tasks contain text clustering, text categorization, concept/entity extraction, creation of granular taxonomies, document summarization, analysis, and entity relation modeling ..

B. Clustering

Clustering is done using one or more attributes by identifying a cluster of correlating results. Clustering is useful to identify different information because it correlates with other examples so we can see where the similarities and ranges agree. Clustering can work both ways. We can assume that there is a cluster at a certain point and then use our identification criteria to see if we are correct

IV. QUASI CLIQUE TECHNIQUE

A. Normalized Interaction Strength

We calculate the normalization value of interactive strength for every friend by dividing the interaction strength with the total number of interaction to his all friends.

B. Cumulative Normalized Interaction Strength

$$C_n = C_{n-1} + B_n$$

C. Strong Friends

Strong Friends (sui), we define $S_{ui} = \{s_1, s_2, \dots, s_n\}$ as a set in descending order based on nis_{ui}, f_j . When the cumulative normalized interaction strength (nis_{ui}, f_j) exceeds the minimum strength value (min_{str}) we consider up to those friends as a strong friend set. The set indicates that the user (ui) is most likely going to interact with these friends.

D. Algorithm Steps

a) Identification of User's Interests

- extract the user posts from the server (M_i)
- Tokenization [keyword extraction method]
- Clustering the messages shared by the users (grouping of similar objects) by comparing with the predefined dataset (created by the admin)
- Identify the user's area of interest (cluster with more number of objects)

b) Strong Friends Prediction

- Scan the Friend database and community database
- Normalization [normalized interaction strength] (nis_{ui}, f_j)
- Predict the cumulative normalized interaction strength
 - $C_n = C_{n-1} + B_n$
- Set Minimum strength (min_{str})
- Recognizing sui and wui (strong friends)- Check if ($C_{NIS} > min_{str}$)
- Add to strong friends
- Only consider those communities (C_{ui}) [based on user's area of interest] which contains strong friends.
- Calculate the normalized interaction strength (nis_{ui}, f_j) based on the community.
- Recommendation – display the communities (C_{ui}) in the descending order.
- If no communities which contains strong friends then



- calculate the normalized interaction strength(nisui,fj) for all communities (my AOI)
- Recommendation – display the communities(Cui) in the descending order.

V. CONCLUSION AND FUTURE WORK

The system “Community Recommendation” is developed and tested successfully and satisfies all the requirement of the client. The goals that have been achieved by the developed system are: a) User area of interest is found. b) Strong friends found.

c) Community recommended by combining both the results of user area of interest and strong friends .Future work includes: One can add up the calculations of interaction strength in addition to the postings like the no. of comments, the number of times message exchanged, number of likes given to the post into the consideration. Additionally the visitor query functions as a future enhancement to the application, where the website visitor can send queries to the administrator of the website We can add the customer as an actor to the application, where member of the community can rate the community, based on the community ratings, a new user can decide the best community for him or her.

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