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Friend Recommendation System Using Location-based Social Networks : A Review

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***Abstract* – Nowadays use of social networking site is increasing exponentially. Almost 90 to 95 percent of the young generation (especially students) are using social networking services. Every social networking site is using different factors for recommending friends. These factors may include social graph, tastes, moral standards, habits, attitudes, profession, etc. Two decades ago, people typically made friends with others who live or work surrounding to themselves like neighbors or colleagues. With the rapid advances in social networks, services such as Facebook, Twitter, Google+ have provided us new ways of making friends. So there is a big challenge with the social networking services which is how to recommend a good friend to a user.**

Index Terms : social networking system; services; recommendation system; object; link recommendation; user.

I. INTRODUCTION

This Some social networking services advise friends to users based on their social graphs (Friends of friends or common friends), which may not be the most correct to reflect a user's preferences on friend selection in real life. In some system, a semantic based friend recommendation system for social networks is used, which advice the friends to users based on their life styles but not of social graphs. This system measures the similarity of life styles between users, and advice the friends to users if their life styles have high similarity .Some system propose a similarity metric to determine the similarity of life styles between users, and calculate users' impact in terms of life styles with a graph.

Upon receiving a query, the system recommends a list of people with highest recommendation probability to the query user.[1] The emergence of social networks from the Internet sparked a major reform in information spread. We have observed that right from the data to search and from search to social interaction, users around the galaxy are now deeply involved with the Internet. With the help of social networks, user-generated record/document is comparatively more accessible than before.

A powerful aspect of social networks is the customization of user experiences.[3] Recommendation systems constitute a large role in providing quality customized user experiences. The major difficulty in developing relevant friend recommendations is due to the non-static nature of humans' perception of friendship, which establishes a cause for heterogeneity in social networks. It is usual and common for humans to change their insight of relationship [3]. Further, this acuity varies from person to person in which a social network can undergo recurrent and unforeseen change over time even without the starter of new nodes[3]. Two decades ago, people typically made friends with others who sentient or work close to themselves, such as colleagues or neighbors. We can call friends made through this old-fashioned process as G-friends, i.e., geographical locationbased friends as they are prejudiced by the geographical distances between each other.

With the rapid growth in social networks, social networking services such as Facebook, Twitter and Google+ have provided us radical ways of making new friends. According to Facebook statistics, a user has an average of around 130 friends, perhaps larger than any other time in history. One difficulty with the existing social networking services is how to suggest a good friend to the users. Most of them rely on pre-existing user relationships to pick friend candidates.

For example, Facebook recommends on a social link analysis among those who already share common friends and suggest symmetrical users as potential friends. Unfortunately, this approach may not be the most suitable based on current sociology verdicts. According to these studies, the rules to group people together may include: 1) habits 2) attitudes 3) tastes 4) qualification 5) economic level, etc.[1] In the development of friend recommendation system various problems may arise which one need to tackle. These problems may be how to recognize friend contenders based on interests rather than pre-existing relationships, how to automatically get one's interests without one's specification, how to find the

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likeness of interests between different users. The recommendation mechanism can be deployed as a separate application on smartphones or as an surplus to existing social network frameworks. In both cases, it can benefit smart phone users determine friends either among unfamiliar person or within a certain group as long as they share equal life styles.[4] Social networking services have grown into an unlimited basis of information, for that several applications have been proposed to examine information from social networks such as recommender systems. The speed and scalability of such a recommender algorithm is as significant as the actual logic behind the algorithm because such algorithms generally route over a vast graph and executing these would possibly take a lot of time for suggesting items even if there is single user. The elementary idea of recommendation system is to advise items to users. In this paper[5] various recommender systems are discussed. This paper concentrates on giving the overview about the different categories of recommendation techniques developed till now.

II. LITERATURE REVIEW

By taking advantage of sensor-rich smartphones, Friendbook[1], a novel semantic based friend recommendation system, expose life styles of users from user-centric sensor data, evaluates the similarity of life styles between users, and suggest the friends to users if their life styles have high similarity. They further suggest a similarity metric to measure the similarity of life styles between users, and calculate users' impact in terms of life styles with a graph. Upon receiving a query containing request, Friendbook gain coming a list of people with maximum recommendation scores to the query user. Finally, Friendbook incorporates a feedback mechanism to further improve the recommendation precision.

"A Survey on Friendbook Using Semantic based Friend Recommendation System" by S. Adsure, A. Arane[2] in his work proposed the following : 1)Recommendation systems can be separated into two areas of center: object suggestion and link recommendation. 2)First one is item or object suggestion (e.g. Amazon, Netflix) 3)Second one is Person to person communication destinations (e.g. Facebook, LinkedIn) 4)My work is focused on the second one. Recommendation systems that try to recommend items (e.g., music, movie, and books) to users have become more and more popular in recent years.

For instance, Amazon [6] advices items to a user based on items the user previously visited, and items that other users are looking at. Netflix[7] and Rotten Tomatoes[8] advice movies to a user based on the user's preceding rating and watching habits. Normally speaking, prevailing friend recommendation in social networking systems, e.g., LinkedIn, Twitter and Facebook suggest friends to users if, according to their social relations, they share mutual friends. Other recommendation systems have also been proposed by researchers. For example, Bian and Holtzman [9] have provided a collaborative filtering friend recommendation system based on personality matching. Kwon and Kim [10] presented a friend recommendation system which is using physical and social context. Yu et al. [11] suggested geographically related friends in social network by using GPS information and social network structure. Hsu et al. studied the problem of link recommendation in weblogs and similar social networks, and presented an approach based on collaborative recommendation using the link structure of a social network and content based recommendation using mutual declared interests.

Gou et al. presented a visual system, to support users to explore and determine friends interactively under the framework of interest, and described a case study using the system to discover the recommendation of friends based on people's classification behaviors in a music community. These existing friend recommendation systems, however, are considerably diverse from the proposed work, as we exploit current sociology outcomes to advice friends based on their analogous life styles instead of social relations.

J. Naruchitparames, M.H. Gunes, S.J. Louis in their work[3] proposed the following: Social networking sites employ recommendation systems in contribution to providing better user experiences. The difficulty in developing recommendation mechanism is mainly due to the assorted nature of social networks. Their contribution presents an approach to friend recommendation systems by using complex network theory and a cognitive theory to provide quality friend recommendations while simultaneously finding an individual's insight of friendship.

Their research shows that by combining genetic algorithms and network topology, superior recommendations can be accomplished compared to each individual counterpart. Their approach was tested on 1,200 Facebook users in which they observe the combined method to outperform purely social or purely network-based approaches. Their primary outcomes shows strong potential for developing link recommendation mechanism using this combined methodology of personal comforts and the underlying network.

III. CONCLUSION

This paper focuses on the overview of different friend recommendation techniques. Different techniques which are taken into account in this paper are: novel semantic based friend recommendation system based on lifestyle of users, object recommendation techniques by Amazon which suggest based on items previously visited, Netflix

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based on the items or products that other users are looking at, and link (person) recommendation techniques which Facebook, LinkedIn are following based on social graph or social relations (friends of friend). Similarly, some recommendation techniques are based on previous ratings or feedback, techniques depending upon collaborative filtering and personality matching, using physical and social context. Other recommendation techniques involves the use of GPS statistics to advise geographically related friends, friend recommendation techniques by using complex network theory, cognitive theory and a Pareto-optimal genetic algorithm.

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