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A Modern Approach of Discovering Friends in Social Networks Based on Friend Matching Graph

P.Abirami[1], B. Moohambigai[2]
PG Scholar,Department of Computer Science and Engineering,Arunai Engineering College, Thiruvannamalai, India.
Assistant professor,Department of Computer Science and Engineering,Arunai Engineering College, Thiruvannamalai, India.
abirami611@gmail.com, kmooha21@gmail.com

Abstract— SNS is a platform to build social networks or social relations among people based on their social graph It is not satisfied to user's preference on friend selection in real life. Mean while in prosposed system,we recommend friend by used semantic-based (or)user based on their lifestyle. By taking merits of sensor-rich smartphones, Friend matching graph find out something life styles of people from user-centric sensor data, action to achieve something the similarity of life styles between users, and to advise someone to users if their life styles have most similarity. An extra ordinary quality by data mining, A user's daily life documents are extracted by using the Hierarchical dirichlet algorithm . Past a certain point ,a similar metric to measure the similarity of life styles between users and enumerate the recommend user's the action of one object coming forcibly into contact with another. When receiving a request ,It returns a list of social network user with highest recommendation scores to the query user. At last, Friend matching graph combine with another to form a whole the feedback mechanism to further improve the recommendation user accurate. We implemented on the Android-based smartphones, and its performance on both small-scale experiments and large-scale simulations. The results show that the recommendations defect reflect the preferences of users in choosing friends in social network.

Keywords: Social networks,life style,friend matching graph.

I. INTRODUCTION

For that time, user typically made friends with others who work close to themselves . User recommend friends made through this following fashion , which stands for geographical location-based friends because they are affect by the geographical distances between each other.Findings in sociology and psychology fields indicate that human beings tend to associate and bond with similar others, so called homophily . Due to the stable and long-lasting social bindings, people are more willing to share their personal opinions with their friends,and typically trust recommendations from their friends more than those from strangers and vendors. The phenomenally popular online social networks, such as Facebook, twitter , and Youtube provide novel ways for people to communicate and build virtual communities.

Online social networks not only make it easier for users toshare their opinions with each other, but also serve as a platform for developing quantitative online recommendation algorithms to automate the otherwise manual and anecdotal recommendations in real life social networks. This paper presents an effort to develop a Bayesianinference-based recommendation algorithm for online social networks. One common type of analysis is the identification of communities of users with similar interests [1], [2]. Another research direction is the identification of content that could be of potential interest, whether this is a product review, a blog, or a tweet. Collaborative filtering is the most broadly adopted technique used to predict future item ratings based ontheuser's past behavior as well as ratings of other similar users. It has been shown that incorporating social network relationships (e.g., friendship) and respective opinions/ratings improves the prediction, and consequently the recommendation process [3]–[5]. A similar line of work focuses on content ranking, which is consequently employed to recommend the top-ranked items (reviews, blogs, comments, tweets, etc.) to users. This is particularly important since the rapid increase in terms of content and users of social media shifts the problem ofinformation search to that of information discovery. The largest body of work in this area generates overall rankings and only recently there have been some efforts in personalizing the ranking and in providing different rankings depending on the scope under which the network is examined.

II. RELATED WORKS

The analysis of content and links in social networks has gained a lot of momentum, resulting in an increase of research in the related fields. In what follows, we examine related work in the areas covered by our system, namely trust and trust propagation, time dynamics and negative trust, with an emphasis on the works that generate user recommendations. Even though the reputation mechanism is an integral part of our system, due to space limitations, we omit a discussion on the related work since our main focus is on the system's characteristics mentioned previously. Trust can be defined as "Expectancy of an agent to be able to rely on some other agent's recommendations".

The user faces the problem of evaluating trustworthiness of a user in the OSNs. Opinions, reputations, recommendations and actions that a user performs in the OSNs influence his trustworthiness. shows block diagram of howcalculation of Trust depends on reputation, identity and profile of a user. When a user creates an account/profile on an OSN site, he/she enters his/her personal information to create a profile page. User has the choice to select which part of the information can be in public domain and which part of information has to be in private domain. After creating an account, user's home page shows details of other users and groups connected to them. Reputation means various activities performed by a user on OSN. At the end, Trust of a user is calculated based on information feed in the profile page, user's personal details, groups, events and applications to whom the user is connected

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and various actions performed by the user on the site.

The need for weighted modeling of links between users caused different research to deal with measurement and prediction of users' relationship strength in recent years. The idea of link strength and its importance was first suggested by Granovetter. He realized that weak links are good sources of information because the other side node of these links has access to clusters and groups which can present useful information . Some years later, Constant et al proposed the role of weak ties in reaching the suitable suggestion and answer. They pointed out when the strong links could not present useful answers due to shortage of information, weak links could compensate for it provided with motivation. clustered peers having semantically similar data into communities, and found the smallworld property from the clustering, which can be leveraged to enhance the efficiency of intra- and inter-cluster querying. Chen et al. built a search protocol, routing through users havingcommon interests to improve searching performance. proposed a social based P2P assisted video sharing system through friends and acquaintances, which can alleviate thetraffic of servers and share videos efficiently.constructed a P2P overlay by clustering common-interestusers to support efficient short video sharing. grouped users by interests for efficient file querying and used the relevant judgment of a file to a query to facilitate subsequent same queries. proposed a multi-attribute range query method with locality-awareness for efficient file searching.

III. SYSTEM ARCHITECTURE

Activity recognition serves as the basis for extracting high-level daily routines (in close correlation with life styles) from low-level sensor data, which has been widely studied using various types of wearable sensors. Zheng et al. used GPS data to understand the transportation mode of users used data from wearable sensors to recognize activities based on the Hidden Markov Model (HMM). recognized static postures and dynamic transitions by using accelerometers and gyroscopes.The advance of smartphones enables activity

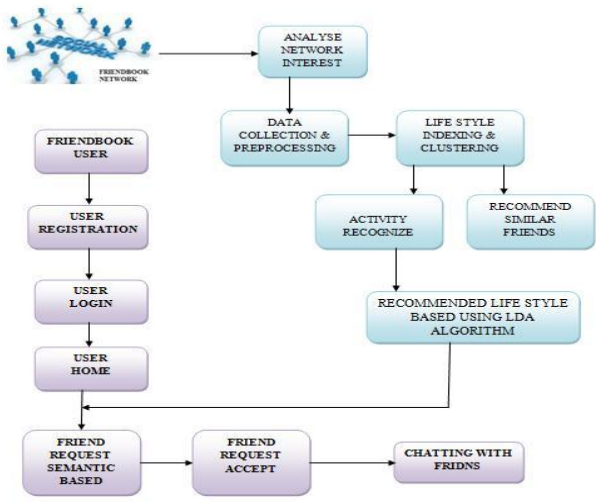

Figure 1: System Architecture

A. Life Style Modeling

The probabilistic topic model could discover the probabilities of underlying "topics". Therefore, we adopt the probabilistic topic model to discover the probabilities of hidden "life styles" from the "life documents".In probabilistic topic models, thefrequency of vocabulary is particularly important, as different frequency of words denotes their information entropy variances. Following this observation, we propose the "bag-of-activity" mode to replace the original sequences of activities recognized.

B. ActivityRecognition:

The number of activities involved in the analysis is unpredictable and it is difficult to collect a large set of ground truth data for each activity, which makes supervised learning algorithms unsuitable for our system.Therefore, we use unsupervised learning approaches to recognizeactivities. Here, we adopt the popular K-means clustering algorithm [9] to group data into clusters, where each cluster represents an activity. Note that activity recognition is not the main concern of our paper. Other more complicated clustering algorithms can certainly be used. We choose K-means for its simplicity and effectiveness.

C. Life Style Extraction Using LDA

The Expectation-Maximization (EM) method to solve the LDA decomposition,where the E-step is used to estimate the free variational Dirichlet parameter g and multinomialparameter F in the standard LDA model and the Mstepis used to maximize the log likelihood of the activitiesunder these parameters. After the EM algorithm converges,we are able to calculate the decomposed activity-topicmatrix. Readers are referred to for more details of the LDA algorithm and alternative decomposition approaches. It is worth noting that the matrix decomposition process can be implemented more efficiently through incremental.

D. Friend-Matching Graph Construction

Friendbook also uses GPS location information to help users find friends within some distance. In order to protect theprivacy of users, a region surrounding the accurate location will be uploaded to the system. When a user uses Friendbook, he/she can specify the distance of friends before recommendation. In this way, only friends having similarity with the user within the specified distance can be recommended as friends.

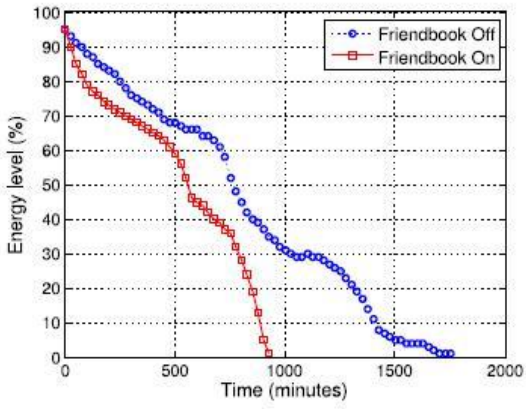

Fig. Energy consumption comparison.

IV. CONCLUSION

In this paper, the design and implementation of Friendbook, a semantic-based friend recommendation system for social

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networks. Different from the friend recommendation mechanisms relying on social graphs in existing social networking services, Friendbook extracted life styles from user-centric data collected from sensors on the smartphoneand recommended potential friends to users if they share similar life styles. We implemented Friendbook on the Android-based smartphones, and evaluated its performance on both small-scale experiments and large-scale simulations. The results showed that the recommendations accurately reflect the preferences of users in choosing friends.

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