Friendbook: A Semantic-based Friend Recommendation System for Social Networks

Existing social networking services recommend friends to users based on their social graphs, which may not be the most appropriate to reflect a user's preferences on friend selection in real life. In this paper, we present Friendbook, a novel semantic-based friend recommendation system for social networks, which recommends friends to users based on their life styles instead of social graphs. By taking advantage of sensor-rich smartphones, Friendbook discovers life styles of users from user-centric sensor data, measures the similarity of life styles between users, and recommends friends to users if their life styles have high similarity. Inspired by text mining, we model a user's daily life as life documents, from which his/her life styles are extracted by using the Latent Dirichlet Allocation algorithm. We further propose a similarity metric to measure the similarity of life styles between users, and calculate users' impact in terms of life styles with a friend-matching graph. Upon receiving a request, Friendbook returns a list of people with highest recommendation scores to the query user. Finally, Friendbook integrates a feedback mechanism to further improve the recommendation accuracy. We have implemented Friendbook on the Android-based smartphones, and evaluated its performance on both small-scale experiments and large-scale simulations. The results show that the recommendations accurately reflect the preferences of users in choosing friends.

EXISTING SYSTEM:

Most of the friend suggestions mechanism relies on pre-existing user relationships to pick friend candidates. For example, Facebook relies on a social link analysis among those who already sharecommon friends and recommends symmetrical users as potential friends. The rules to group people together include:

1. Habits or life style
2. Attitudes
3. Tastes
4. Moral standards
5. Economic level; and
6. People they already know.

Apparently, rule #3 and rule #6 are the mainstream factors considered by existing recommendation systems.

DISADVANTAGES OF EXISTING SYSTEM:

- Existing social networking services recommend friends to users based on their social graphs, which may not be the most appropriate to reflect a user's preferences on friend selection in real life

PROPOSED SYSTEM:

- A novel semantic-based friend recommendation system for social networks, which recommends friends to users based on their life styles instead of social graphs.
- By taking advantage of sensor-rich smartphones, Friendbook discovers life styles of users from user-centric sensor data, measures the similarity of life styles between users, and recommends friends to users if their life styles have high similarity.
- We model a user's daily life as life documents, from which his/her life styles are extracted by using the Latent Dirichlet Allocation algorithm.
- Similarity metric to measure the similarity of life styles between users, and calculate users'
- Impact in terms of life styles with a friend-matching graph.
- We integrate a linear feedback mechanism that exploits the user's feedback to improve recommendation accuracy.

ADVANTAGES OF PROPOSED SYSTEM:

- Recommend potential friends to users if they share similar life styles.
- The feedback mechanism allows us to measure the satisfaction of users, by providing a user interface that allows the user to rate the friend list

MODULES:

- Life Style Modeling
- Activity Recognition
- Friend-matching Graph Construction
- User Impact Ranking

MODULES DESCRIPTION:

Life Style Modeling

Life styles and activities are reflectionsof daily lives at two different levels where dailylives can be treated as a mixture of life styles and lifestyles as a mixture of activities. This is analogous to

thetreatment of documents as ensemble of topics and topicsas ensemble of words. By taking advantage of recentdevelopments in the field of text mining, we model thedaily lives of users as life documents, the life styles astopics, and the activities as words.Given “documents”, the probabilistic topic modelcould discover the probabilities of underlying “topics”.Therefore, we adopt the probabilistic topic model todiscover the probabilities of hidden “life styles” fromthe “life documents”.Our objective is to discover the life stylevector for each user given the life documents of all users.

Activity Recognition

We need to first classify or recognizethe activities of users. Life styles are usually reflected asa mixture of motion activities with different occurrenceprobability.Generally speaking, there are two mainstream approaches:supervised learning and unsupervised learning.For both approaches, mature techniques have beendeveloped and tested. In practice, the number of activitiesinvolved in the analysis is unpredictable and it is difficultto collect a large set of ground truth data for eachactivity, which makes supervised learning algorithmsunsuitable for our system. Therefore, we use unsupervisedlearning approaches to recognize activities.

Friend-matching Graph Construction

To characterize relations among users, in this section, wepropose the friend-matching graph to represent the similaritybetween their life styles and how they influenceother people in the graph. In particular, we use the linkweight between two users to represent the similarity oftheir life styles. Based on the friend-matching graph, wecan obtain a user’s affinity reflecting how likely this userwill be chosen as another user’s friend in the network.We define a new similarity metric to measurethe similarity between two life style vectors.Based on the similarity metric, we model the relationsbetween users in real life as a friend-matching graph.The friend-matching graph has been constructed to reflectlife style relations among users.

User Impact Ranking

The impact rankingmeans a user’s capability to establish friendships inthe network. In other words, the higher the ranking,the easier the user can be made friends with, becausehe/she shares broader life styles with others.Once the ranking of a user is obtained, it providesguidelines to those who receive the recommendationlist on how to choose friends. The ranking itself, however,should be independent from the query user. Inother words, the ranking depends only on the graphstructure of the friend-matching graph, which containstwo aspects: 1) how the edges are connected; 2) howmuch weight there is on every edge. Moreover, theranking should be used together with the similarityscores between the query user and the potential friendcandidates, so that the recommended friends are thosewho not only share sufficient similarity with the queryuser, and are also popular ones through whom the queryuser can increase their own impact rankings.

SYSTEM REQUIREMENTS:

HARDWARE REQUIREMENTS:

- System : Pentium IV 2.4 GHz.
- Hard Disk : 40 GB.
- Floppy Drive : 1.44 Mb.
- Monitor : 15 VGA Colour.
- Mouse : Logitech.
- Ram : 512 Mb.

SOFTWARE REQUIREMENTS:

- Operating system : Windows XP/7.
- Coding Language : JAVA/J2EE
- IDE : Netbeans 7.4
- Database : MYSQL