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FriendBook+: An Activity Based Friend Recommendation System for Social Networks

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Abstract: ***Existing social networking services recommend friends to users based on their social graphs, which may not be the most appropriate to reflect a users preference on friend selection in real life. This paper present Friend book a novel semantic-based friend recommendation system for social networks, which recommends friends to users based on their life styles and also depend on how active the users are on social networks. This paper also considers chat for recommending friends. Here users daily life as model as life documents, from which his/her life styles are extracted by using the Latent Dirichlet Allocation algorithm. After that the paper proposes a similarity metric to measure the similarity of life style between users. Finally it returns a list of people with highest recommendation.***

Keywords: LDA, Friend recommendation, Social networks, lifestyle, EM

1. Introduction

Twenty years ago, people typically made friends with others who live or work close to themselves, such as neighbors or colleagues. With the rapid advances in social networks, services such as Facebook, Twitter have provided us revolutionary ways of making friends. The challenge with existing social networking services is how to recommend a good friend to users. Most of them rely on pre-existing user relationships to pick friends. Most of them relay on pre-existing user relationships to pick friend candidates.

2. Motivation and Related Works

Recommendation system that try to suggest items to users have become more and more popular in recent years. For instance Amazon[1] recommends items to users previously visited.

Recently, with the advance of social networking systems friend recommendation has received a lot of attention.
Existing friend recommendation in social networking systems like facebook recommend friends to users, if according to their social relations, they share common friends.

These existing friend recommendation systems, however are significantly different from this work, as it exploit recent sociology findings to recommend friends based on their similar life styles instead of social relations.

Activity recognition serve as the basis for extracting high-level daily routines from low-level sensor data, which has been widely studied using various types of wearable sensors. Cenceme[2] used multiple sensors on the smart phone to capture user's activities, state, habits and surroundings. In this paper it uses the probabilistic topic model to discover life styles.

3. Implementation

FriendBook which adopts a client-server mode where each client is a smartphone carried by a user and the servers are data centers or clouds. On the client side, each smartphone can record data of its user, perform real-activity recognition and
report the generated. A probabilistic generative model for friend bookis illustrated in the figure. On the server side ,seven modules are designed to fulfil the task of friend recommendation.

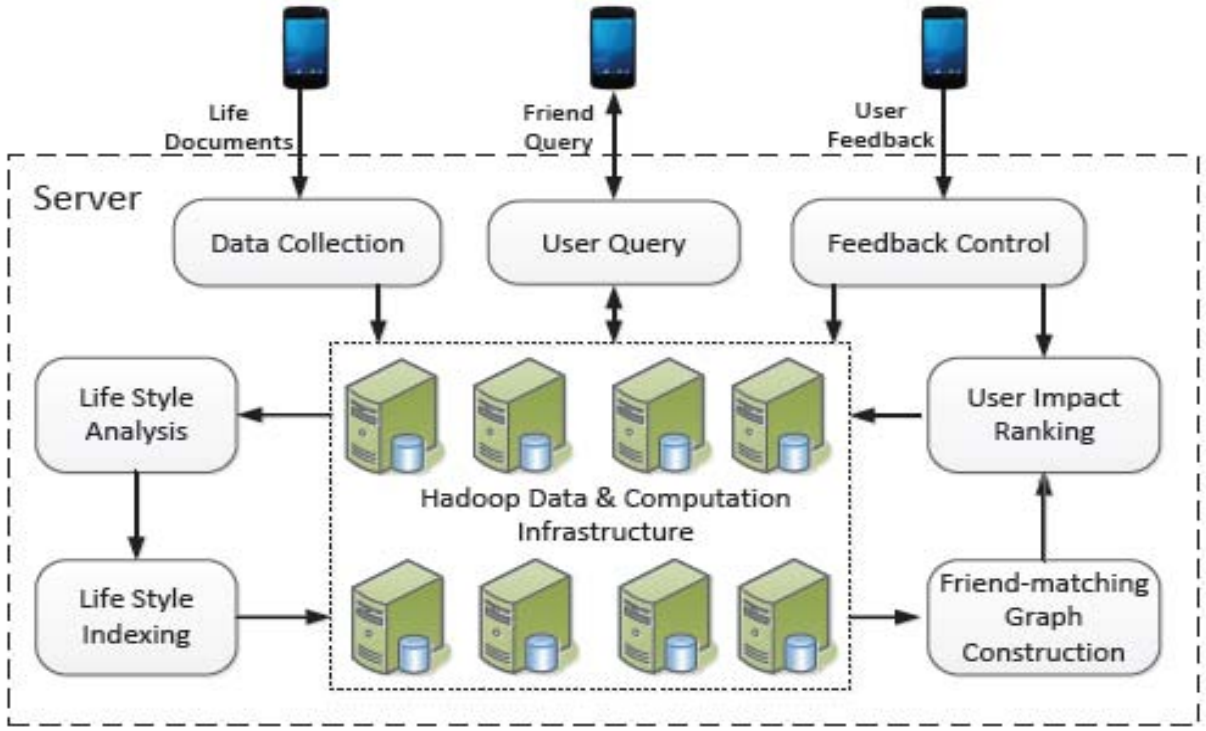

Figure 1: System Architecture of Friendbook

The data collection module collects life documents from user's smartphone. The life styles of users are extracted by the life style analysis module with the problastic topic model. Then the life style indexing module puts the life style of users into the database in the format of (lifestyle, user) instead of (user, lifestyle). A friend-matching graph can be constructed accordingly by the friend-matching graph construction module to represent the similarity relationship between user's life styles.

By taking advantage of recent developments in the field of text mining. We model the daily lives of users as life documents, the life style as topics, and the activities as words. The problastic topic model is used to discover the probabilities of hidden lifestyles from life documents. In this the frequency of vocabulary is particularly important, as different frequency of words denotes their information entropy variances.

Then it propose the bag-of-activity model to replace the original sequences of activities recognized based on the raw data with their probability distributions. Thereafter, each user has a bag-of-activity representation of his/her life document, which comprises a mixture of activity words.

Then it first classify or recognize the activities of users. Life styles are usually reflected as a mixture of motion activities with different occurrence probability. Therefore two motion sensors, accelerometer and gyroscope, are used to infer user's motion activities. Two main stream approaches: supervised learning and unsupervised learning. In practice , 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, it use unsupervised learning approaches to recognize activities. Here we adopt the popular K – means for its simplicity and effectiveness. Since the raw data collected on the smartphone are noisy, we first use a median filter[3] with sliding windows to filter out the outliers of the noisy data.

The matrix decomposition problem is actually the Latent Dirichlet Allocation (LDA) model[5] Here it uses the Expectation-Maximization (EM) method to solve the LDA decomposition, where the E- step is used to estimate the free variational Dirichletparameter and M-step is used to maximize the log likelihood of the activities under these parameters. After the EM algorithm converges, we calculate the decomposed activity- topic matrix.

To characterize relations among users, we propose the friend-matching graph to represent the similarity between their life styles and how they influence other people in their lifestyles and how they influence other people in the graph..

Final step is to identify the User impact ranking. The impact ranking means a user's capability to establish friendship in the network. The higher the ranking the easier the user can be made friends with, because he/she shares broader life style with others. Inspired by page ranking[4] which is used in web page ranking.

Once the raking of a user is obtained, it provides the guidelines to those who receive the recommendation list on how to choose friends. The ranking itself, however, should be independent from the query User. Rankingdepends only one the graph structure of the friend matching graph, which contains two aspects: how the edges are connected and how much weight there is on every edge. Moreover the ranking should be used together with the similarity with the query user, and are also popular ones through whom the query user can increase their own impact ranking.

4. Conclusion

In this paper, I introduce a semantic-based friend recommendation system for social networks. Different from the friend recommendation mechanisms relying on social graphs in existing social networking services, it extracted life styles from user-centric data collected from sensors on the smartphone and recommend friend to users if they share similar life styles. In this paper not only the lifestyles of the users but the activity time and also the chat message is being taken. It analysis how long the person is using the application..

References

[1] Amazon. http://www.amazon.com/
[2] E. Miluzzo, N. D. Lane, S. B. Eisenman, and A. T. Campbell. Cenceme-Injecting Sensing Presence into Social Networking Applications. Proc. of EuroSSC, pages 1-28, October 2007.
[3] G. R. Arce. Nonlinear Signal Processing: A Statistical Approach. John Wiley & Sons, 2005.
[4] L. Page, S. Brin, R. Motwani, and T. Winograd. The Pagerank Citation Ranking: Bringing Order to the Web. Technical Report, Stanford InfoLab, 1999..
[5] D. M. Blei, A. Y. Ng, and M. I. Jordan. Latent Dirichlet Allocation. Journal of Machine Learning Research, 3:993-1022, 2003..
[6] P. Desikan, N. Pathak, J. Srivastava, and V. Kumar. Incremental page rank computation on evolving graphs. Proc. of WWW, pages 1094-1095, 2005.

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