Recommending Friends on Social Network with Artificial Intelligence Approach

Akram Shaikh[1], Sandeep Khanna[2]

[1]Department of Computer Science Engineering, Pdm.V. B. Kolte College of Engineering, Malkapur Dist-Buldhana Maharashtra India

[2]Assistant Professor, Department of Computer Engineering, Pdm.V. B. Kolte College of Engineering,
Malkapur Dist-Buldhana Maharashtra India

Abstract: *In this smart world to connect from the world we use social network. In the old times the people used be friend with their neighbor's colleagues and any other person related to them. When the people shifted to the social networking the domain of friends increased a lot and a most important feature is the friend recommendation as the system suggests friends to the used based on the mutual friends, this technique is called as the social graphs. Social graphs may or may not be the most appropriate technique to reflect a user's preferences on friend selection as such type of friend selection is not done in real world. In this project we present an AI based friend recommendation system for social networks, which recommends friends to users based on their life styles instead of social graphs. It majorly takes the advantage of users Post Comments and profile; all these are rich in information. It discovers the lifestyle of the user from user-centric data and measures the similarity with the other users and we recommend them. If the average of the similarity is greater than the mean of similarities. AI based Friend recommendation system returns a list of people with highest recommendation scores to the query user. The results show that the recommendations accurately reflect the preferences of users in choosing friends.*

Keywords: Friend recommendation, Artificial Intelligence, social networks, life style, jaccard distance

1. Introduction

When the technology was not a boom twenty years ago people typically made friends with them who live or work close to themselves such as neighbors and colleagues. Such friends are termed as the G-friends that is physical position base friends, the name is given because the friends were made on the basic of the physical distances between each other. With the progress in the social networks like facebook, twitter, Google+ and many more they have supplied with radical ways of making friends. As a statistics provided by facebook on an standard every user has 130 friends which is larger than the old concept [1][2][3].

To suggest a regular friend to the user is the major dispute to the presented scheme. In the conventional scheme the technique depends on the pre-offered user associations to select friend candidates. For example, Facebook depends on a social connection analysis among those users who already share common friends and recommends equal users as potential friends [11]. Unluckily, this advance might not be the suitable based on most modern study. For recommending friends there are a small number of convention which are behavior, routine, attitudes, tastes, ethical principles, economic level and people they already know. this Rules are widely used by all the recommendation scheme and can offer with the top outcome but it is not easy to collect behavior or life style of a person on the things he does on the net. If there is technique that could collect information on user's every day routines and actions, then that can be broken rules and suggest friends to people based on their related life styles [1]. The recommendation structure can be deployed as a separate application on Smartphone or to existed frameworks. Then this method can grasp the daily life and then the recommendation can be specified easily.

Life style consists of day to day activities of human, there may be hundreds of actions which can shape a significant succession and aid the life style system to grasp. The word activity are used to specially submit to the actions taken in the order of seconds, such as "sitting", "walking", or "typing", while the expression life style are used to specify higher-level concepts of daily lives, such as "office work" or "shopping". For instance, the "shopping" life style mostly consists of the "walking" activity, but may also contain the "standing" or the "sitting" tricks
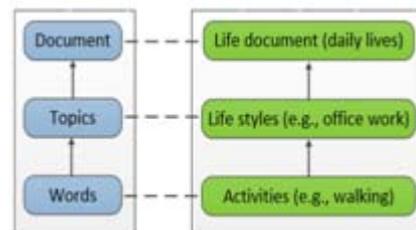

Figure 1.1: An analogy between word documents and people's daily lives

The figure shows an example model. It describes the analogy between people's daily lives and documents. Here daily life can be treated as the document life style as topics and activities as the words. So if any other user has the same or near to same lifestyle is recommended [1][3][4].

Here in this system similar kind of method have been proposed. In this system the user's comments likes and post profile are analyzed As these three somewhat related to the life style of the user as these are also activities which users do most on the social networks. Once this method calculates the similarity percentage this system will be able to recommend friends to the users.

2. Existing System

Till now all the recommendation systems works on two basic principles one is the user likeness and mutual friends and the

Paper ID: NOV152104

other one is the community liked system. The recommendation of the Facebook is on the basis on the mutual friends. More the mutual friends the more users are recommended as the friends. But this may or may not be the case as in real life it is not important that having too many mutual friends can make the two of them friends too. Similar recommendation can be seen in the movie recommender too [10][11][6].

Here the recommendation is based on the group of people. For example if a particular movie is liked by 70 people from 100 than the user who still not have seen the movie are recommended for the movie which is mostly loved. But this system too fails as the taste and likes of each and every user is different they may not like the movie or the movie is then just a bad recommendation from the system [1][2].

Most of the pre-existing relationship to pick up the friends. Facebook relies on social link analysis among those who already share common friends and recommends symmetrical user as common friends Existing social network system recommends friend to user based on the social graph which may not be the most appropriate to reflect user's preference on friend selection on real life

Recommendation systems that try to suggest items (e.g., music, movie, and books) to users have become more and more popular in recent years. For instance, Amazon recommends items to a user based on items the user previously visited, and items that other users are looking at[1]. Netflix and Rotten Tomatoes recommend movies to a user based on the user's previous ratings and watching habits[2]. Recently, with the advance of social networking systems, friend recommendation has received a lot of attention. Generally speaking, existing friend recommendation in social networking systems, e.g., Facebook, LinkedIn and Twitter, recommend friends users if, according to their social relations, they share common friends.

2.1 Problems with Existing System

- One challenge with existing social networking services is how to recommend a good friend to a user. Most of them rely on pre-existing user relationships to pick friend candidates.
- Facebook relies on a social link analysis among those who already share common friends and recommends symmetrical users as potential friends.
- Unfortunately, this approach may not be the most appropriate based on recent sociology findings.

3. Proposed System

A friend recommendation system for social networks, which recommends friends to users based on their life styles instead of social graphs. Friend recommendation system discovers profile and daily activities of users, 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 jaccard distance 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[3]. We integrate a linear feedback mechanism that exploits the user's feedback to improve recommendation accuracy.

There are still multiple challenges for extracting users' life styles and recommending potential friends based on their similarities. First, how to automatically and accurately discover life styles from database? Second, how to measure the similarity of users in terms of life styles? Third, who should be recommended to the user among all the friend candidates? To address these challenges, in this paper, we present Recommending Friend on Social Network with Artificial Intelligence. The contributions of this work are summarized as follows:

1) To the best of our knowledge RFSNAI is the first friend recommendation system exploiting a user's life style information discovered from database?
2) Inspired by achievements in the field of text mining, we model the daily lives of users as life documents and use the probabilistic topic model to extract life style information of users.
3) We propose a unique similarity metric to characterize the similarity of users in terms of life styles and then construct a friend-matching graph to recommend friends to users based on their profile and daily activities.
4) We conduct both small-scale experiments and large-scale simulations to evaluate the performance of our system. Experimental results demonstrate the effectiveness of our system.

3.1 Overview

Our society is becoming more and more dependent on social networking sites, which nowadays are used in everyday life, from business to banking, from entertainment to health care. In this section, we give a high-level overview of the Friendbook system. Figure 2 shows the system architecture of Friendbook which adopts a client-server mode where each client and the servers are data centers or clouds.
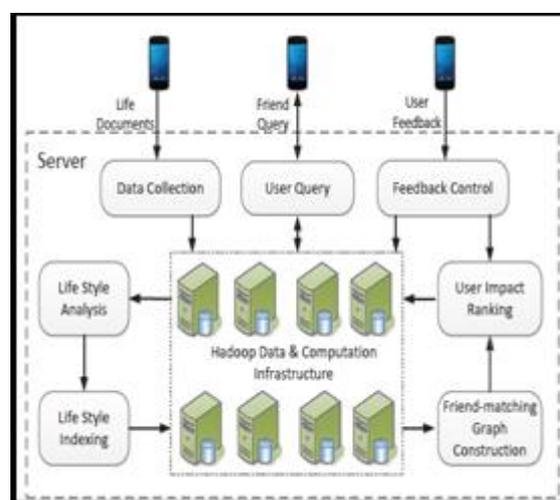

Figure 3.1: System Architecture of Friend recommendation system

On the client side, each user can record data of its user, perform real-time activity recognition and report the

generated life documents to the servers. It is worth noting that an offline data collection and training phase is needed to build an appropriate activity classifier for real-time activity recognition. We choose MySQL as our low level data storage platform and Hadoop Map Reduce as our computation infrastructure [6].

On the server side, seven modules are designed to accomplish the task of friend recommendation. The data gathering module collects life documents from user's system. The life styles of users are extracted by the life style analysis module with the probabilistic topic model. Then the life style indexing module puts the life styles of users into the database in the format of (life-style, user) instead of (user, life-style). A friend-matching graph can constructed accordingly by the friend-matching graph construction module to represent the similarity relationship between users' life styles. The impacts of users are the calculated based on the friend-matching graph by the user impact ranking module. The user query module takes a user's query and sends a ranked list of potential friends to the user as response.

In this proposed system which can extract the life style from social networks and help in recommending friends. There are multiple options to do this, but this system mainly focuses on the user comment, likes and the post, profile which can also reflect the life style of the user. The system will store and create a particular life style from the information. Then while recommending it will check for similar and closely related life styles and recommend friends. The feature of the system will be as follows:

a. It create a Social Network, the features of the network are as follows
1) Authenticated Login and Sign Up.
2) Password Recovery Facility,
3) Members Directory to follow friends,
4) Dashboard for the post from friends,
5) Spaces/ groups to connect and discuss with different people,
6) User Profile,
7) Help/Getting Started Tab
8) Latest Activity Tab,
9) Settings.

All these are the basic requirements of the Social Network created as the front end.

a. Friend Recommender System to recommend friends to the user. The features of the system is as follows:
1) It Should be artificially Intelligent,
2) It should have an authenticated login.
3) There should be a list of the members of the social network.
4) The life style should be extracted from the comments, likes and posts of the users,
5) The Life style should be compared and similar and near to same should be suggested to the user.
6) The time of the process should also be stored.
All these are the features needed by the system to perform the recommendation process

3.2 Design Strategies

The design strategies are based on different paradigms which are as follows:

1) Exploitable Data availability
2) Implicit and Explicit user feedback
3) Domain Characteristics

Here the system has the following components User Model which includes the likes dislikes comments post etc. it has to find the Relevance Score here and the final output recommendation should be output of this system. The various designs are as follows:
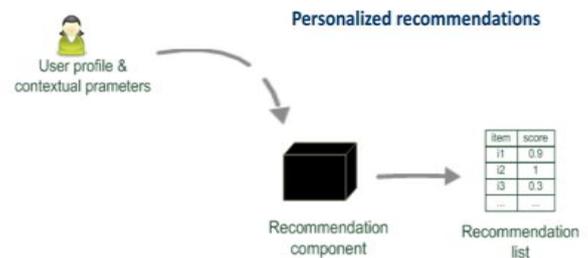

Figure 3.2: Personalized Recommendations

If the system only has the information from the profile of the user this type of recommendation can be used. For example this system uses movies, pages likes in facebook to recommend the movies pages etc to the user to like them.

Figure 3.3: Collaborative systems:

Here the system has the community data of the user and the recommendation system generates the list on the basis of the popular stuffs. For Example the movies suggestion to watch are on this basis.

Figure 3.4: Content Based Design

In the content based design the system analysis of the products is done and the user profile is also done if it matches the user is suggested the products.
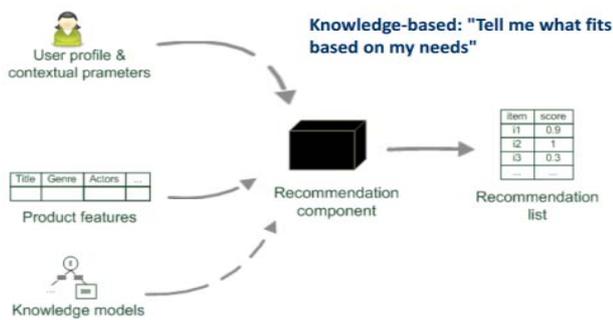
Figure 3.5: Knowledge Based System

In this type of the system the AI comes in the picture, here the user profile, Friend profile and a knowledge models which evaluates both the profiles (user friends) and the recommendation list is created.
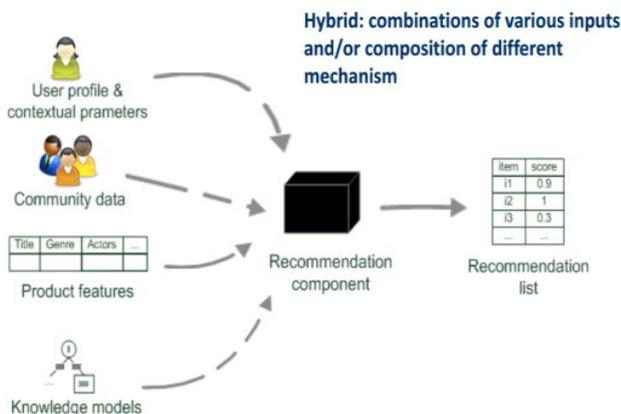

Figure 3.6: Hybrid approach

In this approach the data of the both the user profiles the community data and the knowledge models helps in recommending the friends.

In this project, this system used knowledge based approach as it uses the data of both the user profile and implemented a knowledge model and the output is provided. Here the knowledge model is the jaccard distance algorithm which helps the system in order to calculating the similarity factor. The hybrid approach is not used as it doesn't need a community data for the user analysis.

4. Conclusion and Future Work

In this paper we presented the design and implementation of recommending friends on social network with artificial intelligence approach. It's totally different from the friend recommendation mechanisms relying on social graphs in existing social networking services,

This system extracted life styles which generally includes profile post and comments of user and recommended potential friends to users if they share similar life styles. We implemented recommendation system 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.

References

[1] Sundong Kim, "Friend Recommendation with a Target User in Social Networking Services "In proceeding of IEEE International Conference on Data Engineering(ICDE), Feb2012, PP. 235-239.

[2] Jeff Naruchitparames, Mehmet Hadi Guand Sushil J. Louis "Friend Recommendations in Social Networks using Genetic Algorithms and Network Topology "in proceeding of CEC,2011,PP.29-42.

[3] Matteo Manca, Ludovico Boratto and Salvatore Carta"Producing Friend Recommendations in a Social Bookmarking System by Mining Users Content"

[4] Zhibo Wang, Jilong Liao and Qing Cao. "Friend book: A Semantic-based Friend Recommendation System for Social Networks" in proceeding of IEEE Transaction On Mobil Computing, Jan 2014,PP.538-551

[5] Tanvi Shruti "Social Recommender systems: Improving recommendations through personalization" Under the direction of Professor Steven Lindell Haverford College. Computer Science Department. Spring 2011

[6] Nitai B. Silva, Ing-Ren Tsang, George D.C. Cavalcanti, and Ing-JyhTsang. "A Graph-Based Friend Recommendation System Using Genetic Algorithm" in proceeding World Congress on Computational Intelligence (WCCI) July 2010, PP. 18-23.

[7] Werner Geyer, Jill Freyne, Bamshad Mobasher, Sarabjot Singh Anand, Casey Dugan "Recommender System and Social Web" In Proceedings of the fourth ACM conference on Recommender system, 2010, PP. 379-380.

[8] Katarzyna Musiał "Recommendation system for online social network" published on 23 Sep 2009,PP.124

[9] JieBao, Yu Zheng, David Wilkie and Mohamed Mokbel "A Survey on Recommendations in Location-based Social Networks" in proceeding "Geoinformatica" 6 Feb 2015,PP. 19-52

[10] Hao Ma, Dengyong Zhou, Chao Liu, Michael R. Lyu, and Irwin King "Recommender Systems with Social Regularization". Proceedings of the fourth ACM international conference on Web search and data mining,Jan2011,PP. 287-296

[11] Pooja Tasgave, Amit Dravid. "Friendbook: A Lifestyle based Friend Recommendation System" in proceeding of International Journal for Research in Applied Science & Engineering Technology (IJRASET) March2015,PP. 560-564

[12] K. G. Srinivasa1, Kushagra Mishra, Coca Sai Prajeeth and Ameen Mohammed Talha. "GPU Implementation of Friend Recommendation System using CUDA for Social Networking Services "In proceeding of international conference of Emerging Research of computing, information, communication and application 2013,PP. 891-895

[13] Mariam Adedoyin-Olowe1, Mohamed Medhat Gaber1 and Frederic Stahl. "A Survey of Data Mining Techniques for Social Network Analysis"

[14] Rashmi Sinha and Kirsten Swearingen."Comparing Recommendations Made by Online Systems and Friends" Under the Direction of University of California Berkeley

[15] S.phakitniwankull "Using jaccard coefficient Forkeword similarity" in Proceedings of the International Multi

Conference of Engineers and Computer Scientists (IMECS), March2013 ,PP. 978-988

[16] Robin Burke "Hybrid Recommender Systems: Survey and Experiments "In Proceeding of University, Fullerton, Department of Information Systems and Decision Sciences NOV 2002, pp 331-370

[17] Rohini Nair and Kavita Kelkar "Algorithms and Methods in Recommender System" in proceeding of International Journal of Computer Applications Nov 2013

[18] Facebook statistics. http://www.digitalbuzzblog.com/facebook-statistics-stats-facts-2011/ , On 23sep2015 at 3:13PM.

[19] "Amazon. http://www.amazon.com/, On 1Nov2015 at 4PM.

[20] "Netfix. https://signup.netflix.com/ On 14 Oct 2015 at 12PM.

[21] Namrata M. Eklaspur and Anand S. Pashupatimath."A Friend Recommender System for Social Networks by Life Style Extraction Using Probabilistic Method-"Friendtome" In Proceeding of International Journal of Computer Science Trends and Technology (IJCST), June 2015,PP. 95-101

[22] Pankaj L. Pingate, S. M. Rokade "A Survey of Friendbook Recommendation Services" In proceeding of International Journal of Science and Research(IJSR) 11 Nov2014, PP. 747-749

Author Profile

Akram. H. Shaikh is from Pdm. Dr V.B.Kolte College of Engineering, Malkapur

Prof. Sandeep Khanna is Assistant Professor Pdm. Dr. V. B. Kolte College of Engineering, Malkapur