# *Daily Activity Based Friend Recommendation System*

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**ABSTRACT:** A recommendation system is a software program which endeavors to limit down choices for user in view of their communicated inclinations, past conduct, or other information which can be mined about the user or different users with comparative interests. 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. We introduce Friendbook, a novel semantic-based friend recommendation system for social networks, which recommends friends to users in view of their ways of life and interest rather than social charts. 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. Friendbook discovers life styles and interest of users, measures the similarity of life styles and interest between users, and recommends friends to users if their life styles and interest have high similarity. We propose a unique similarity metric to characterize the similarity of users in terms of life styles and interest and then we construct a friend-matching graph to recommend friends to users based on their life styles and interest. We integrate a linear feedback mechanism that exploits the user's feedback to improve our system accuracy.

**KEYWORDS:** Friend recommendation, mobile sensing, social networks, User life style, Similarity metric, Latent Dirichlet Allocation.

## I. INTRODUCTION

A recommendation system is a software program which endeavors to contract down choices for users in light of their communicated inclinations, past conduct, or other information which can be mined about the user or different users with similar interests. Twenty years prior, individuals ordinarily made friends with other people who live or work near themselves, for example, neighbors or associates. We call friends made through this traditional fashion as G-friends, which stands for geographical location-based friends because they are influenced by the geographical distances between each other.

One test with existing long range informal communication administrations is the way to prescribe a decent friend to a user. The majority of them depend on previous user connections to pick friends hopefuls. Most of them depend on previous user connections to pick friend applicants. For instance, Facebook depends on a social connection investigation among the individuals who as of now share normal friends and prescribes symmetrical users as potential friends. Shockingly, this approach may not be the most suitable in light of late human science discoveries. We introduce Friendbook, a novel semantic-based friend recommendation system for social networks, which recommends friends to users in view of their ways of life and interest rather than social charts. 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. Friendbook discovers life styles and interest of users, measures the similarity of life styles and interest between users, and recommends friends to users if their life styles and interest have high similarity. We propose a unique similarity metric to characterize the similarity of users in terms of life styles and interest and then we construct a friend-matching graph to recommend friends to users based on their life styles and interest. We integrate a linear feedback mechanism that exploits the user's feedback to improve our system accuracy.

## II. LITERATURE SURVEY

D. Sarma, A. R. Molla, G. Pandurangan, and E. Upfal, (2013) have present fast random walk-based distributed algorithms for computing Page Ranks in general graphs and prove strong bounds on the round complexity [1]. First represent distributed algorithm then present a faster algorithm. Both of the above algorithms are scalable, a seach node sends only small (poly log n) number of bits over each edge per round. These are the first fully distributed algorithms for computing Page Rank vector with provably efficient running time.

L. Bian and H. Holtzman, (2011) proposed online friend recommendation through personality matching and collaborative filtering [2]. System in social networks which recommends friends to users based on their life styles instead of social graphs. The main idea of proposed method for friend recommendation consist of three stages; (1) discovers life styles of users from user centric sensor data; (2) measures the similarity of life styles between users; (3) recommends friends to users if their lifestyles have high similarity. Hear user can send query regarding certain issue and user can also send the feedback regarding recommendation.

L. Gou, F. You, J. Guo, L. Wu, and X. L. Zhang (2011), proposed a novel visual system, SFViz (Social Friends Visualization), to support users to explore and find friends interactively under a context of interest [3]. This approach leverages both semantic structure of activity data and topological structures in social networks. In SFViz, a hierarchical structure of social tags is generated to help users navigate through a network of interest. Multi scale and cross-scale aggregations of similarity among people are presented in the hierarchy to support users to seek potential friends. Author report a case study using SFViz to explore the recommended friends based on people's tagging behaviors in a music community.

K. Farrahi and D. Gatica Perez (2011) have present discovering routines from large scale human locations using probabilistic topic models [4]. In this work authors discover the daily location-driven routines which are contained in a massive real-life human dataset collected by mobile phones. Their goal is the discovery and analysis of human routines which characterize both individual and group behaviors in terms of location patterns. They develop an unsupervised methodology based on two differing probabilistic topic models and apply them to the daily

life of 97 mobile phone users over a 16 month period to achieve these goals. Topic models are probabilistic generative models for documents that identify the latent structure that underlies a set of words. Routines dominating the entire group's activities, identified with a methodology based on the Latent Dirichlet Allocation topic model, include "going to work late", "going home early", "working non-stop" and "having no reception (phone off)" at different times over varying time-intervals.

Z. Wang, C. E. Taylor, Q. Cao, H. Qi, and Z. Wang, (2011) proposed Demo: Friendbook: Privacy preserving friend matching based on shared interests [5]. System allows users with similar interests to be quickly introduced based on the similarity of pictures they took. A real online system, named Friendbook, will be implemented on a smartphone network. Due to the limited resources on a smartphone as well as privacy issues, instead of directly comparing the original pictures for similarity measure, Friendbook uses "feature-based" picture comparison. By comparing features extracted from pictures taken by people who want to make friends, their similarity in interests can be automatically inferred based on the content of these pictures. They refer to friends made through Friendbook as "S-friend" for "Semantic-friend". The system also demonstrates the difference between S-friend matching with geographic-based G-friend matching.

X. Yu, A. Pan, L.-A. Tang, Z. Li, and J. Han (2011) present Geo-friends recommendation in GPS-based cyber-physical social network [6]. Propose a geo-friend recommendation problem, and discuss the differences from previously studied link prediction problem. Define and generate a set of GPS patterns to describe people's real life social interaction and correlation. Propose a random walk-based statistical framework for geo-friend recommendation. Design and conduct a series of experiments on both synthetic and real-world datasets. Demonstrate the power of this method in various situations.

J. Kwon and S. Kim (2010) have present a friend recommendation method using physical and social context [7]. The main idea of the proposed method is consisted of the following three stages; (1) computing the friendship score using physical context; (2) computing the friendship score using social context; (3) combining all of the friendship scores and recommending friends by the scoring values.

Reddy, M. Mun, J. Burke, D. Estrin, M. Hansen, and M.Srivastava, (2010) proposed transportation modes by using mobile phones [9]. The focus of this work is on one dimension of context, the transportation mode of an individual when outside. They create a convenient (no specific position and orientation setting) classification system that uses a mobile phone with a built-in GPS receiver and an accelerometer. The transportation modes identified include whether an individual is stationary, walking, running, biking, or in motorized transport.

Y. Zheng, Y. Chen, Q. Li, X. Xie, and W.-Y. Ma, (2010) present understanding transportation modes based on GPS data for web applications [10]. In this article, they report on an approach based on supervised learning to automatically infer users' transportation modes, including driving, walking, taking a bus and riding a bike, from raw GPS logs. This approach consists of three parts: a change point-based segmentation method, an inference model and a graph-based post-processing algorithm.

## III. EXISTING SYSTEM APPROACH

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 share common 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.

- **Disadvantage:**

They 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.

### A. PROPOSED SYSTEM APPROACH

Proposed system presents Friendbook, a novel semantic-based friend recommendation system for social networks, which recommends friends to users in view of their ways of life and interest rather than social charts. 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. Friendbook discovers life styles and interest of users, measures the similarity of life styles and interest between users, and recommends friends to users if their life styles and interest have high similarity. We propose a unique similarity metric to characterize the similarity of users in terms of life styles and interest and then we construct a friend-matching graph to recommend friends to users based on their life styles and interest. We integrate a linear feedback mechanism that exploits the user's feedback to improve our system accuracy.

- **Advantage:**

1) Achieve a semantic-based friend recommendation.
2) Integrate a feedback mechanism to further improve the recommendation accuracy.
3) Model the daily lives of users as life documents and use the probabilistic topic model to extract life style information of users.
4) Generate unique similarity metric to characterize the similarity of users in terms of life styles.

- **Latent Dirichlet Allocation(LDA) Algorithm:**
  - D = Dataset
  - S = Sentence/Comment
  - Sw = Stop Words
  - Rf = Recommend Friends
  - W = {W1,W2…….,Wn}
  - Tw = {Tw1,Tw2,…….,Twm}

```
for (Tw1……Twn)
{
    for (W1.….Wn)
    {
        Tw = P (W1-n / Wn)
```

```
        }
        Rf = max (Tw)
    }
    return Rf ;
```

### B . PROPOSED ARCHITECTURE

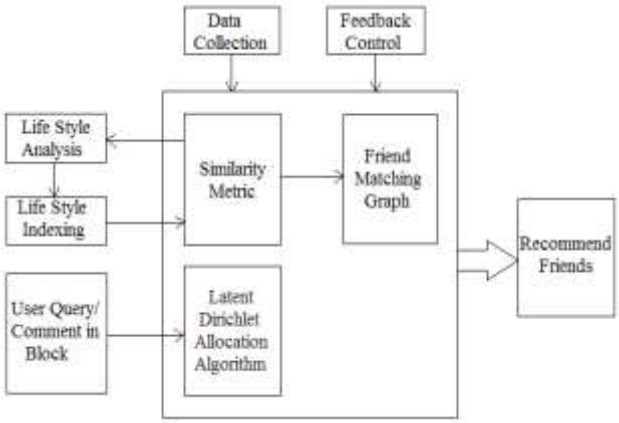


Figure: System Architecture

### IV. RESULTS AND DISCUSSIONS

System is a Web application and Deployed using Tomcat and used Mysql Database. Our System recommends friends based on their lifestyles so it can be done by using two approaches:- Similarity Matrix and User Impact Ranking. In our system we use similarity matrix to recommend friends based on their lifestyles.

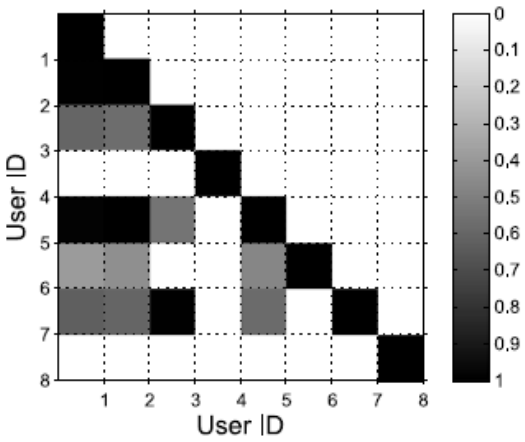


Fig. 1.User's Similarity in the form of Gray Image

Fig.1. shows the gray-scale image representation of the similarity matrix for eight users. The blocks in the diagonal has the darkest color because users always have the perfect match with themselves. As shown in Fig. 1, user 1 has strong relationship with user 2 and user 5, user 3 has strong relationship with user 7, user 6 has relationship with the previously stated users but not very strong, while user 4 and user 8 have no relationship with others at all. The result is consistent with the ground truth of professions shown in Table 1 because people have the same profession usually have the same life styles.

### IV.CONCLUSION

We presented the design of Friendbook, a novel semantic-based friend recommendation system for social networks, which recommends friends to users in view of their ways of life and interest rather than social charts. 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. Friendbook discovers life styles and interest of users, measures the similarity of life styles and interest between users, and recommends friends to users if their life styles and interest have high similarity. We propose a unique similarity metric to characterize the similarity of users in terms of life styles and interest and then we construct a friend-matching graph to recommend friends to users based on their life styles and interest. Then we integrate a linear feedback mechanism that exploits the user's feedback to improve our system accuracy.

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