A Semantic-Based Companion Approval System for Social Networks

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***Abstract*: Existing community networks urge associates to users based on their collective graphs like reciprocated acquaintances, which may not be the most suitable to reflect a user's taste on friend assortment in real life. In order to progress the obtainable methods, a semantic based conviction recommendation system which recommends attendant having high similarities in significance sharing. As a result, the semantic based counsel system maintains essential group of conviction people having analogous interest. On line implicit groups are becoming increasingly outstanding due to the enlargement of neighborhood and social networking sites. We intend LDA algorithm using some selected user properties to update friend-book.**

Index Terms: Semantic, Friend-book, Smart-phone, Social Network, Recommendation

I. INTRODUCTION

With the rapid development of Internet and Web 2.0, online social association, [13] such as Facebook, Twitter, LinkedIn, have befall valuable sources for public opinion mining and sentiment analysis. Millions of users are sharing their views and discussing current issues through social media every day. Micro blog, as a convenient and easily access platform, also attracts more and more people to express their feelings about hot topics. [7] However, as the maximum message length is only 140 characters in micro blog, [10] traditional sentiment analysis methods for topics cannot well perform due to the lack of information. Accessible social networking services acclaim associates to users based on their social graphs, which may not be the most suitable to reveal a user's preferences on companion assortment in real life. Upon getting a appeal, Friend book proceeds a inventory of inhabitants with premier recommendation scores to the query user. [1] Automated social text [11] annotation is the task of suggesting a set of tags for communal documents on shared media platforms. [2] The automated rationalization progression can decline users' cognitive transparency in tagging and recover tag management for improved search, browsing, and recommendation of credentials. It can be formulated as a multi label classification problem. [5] Computer-enabled social services like tagging or sharing are ubiquitous in current web applications that are aimed to a virtual group of users. [4] These services do not only add value and new functionalities to their applications but also create a network of users and services that interconnect them to a wider on-line ecosystem. Presently these social networks essentially use the vast amount of user-created content, and activity logs to relate to grant recommendations and additional multifaceted services. [19] Measuring textual semantic [3] similarity has been a subject of intense discussion in NLP and AI for many years.

A innovative area of investigate has emerged that applies semantic resemblance procedures within Twitter. [18] However, the development of these measures for the semantic analysis of tweets imposes fundamental challenges. The sparse, ambiguous, and informal properties present in social media are hampering the performance of traditional textual similarity measures as "tweets", have special syntactic and semantic characteristics. [15] Nowadays it has been seen that one of the friend in our friend list might have another friend who is not common to both, can become common on internet based social networking sites. A companion is distinct as “one close to another by esteem” [20]. With advent of social networking sites like Whatsapp, Google, Twitter, Facebook, etc. the ways of making friends has changed. According to latest report, around 155 friends per user is an average figure for Facebook. [21] This has been the biggest challenge associated with social networking to get a good friend. At present most of the users rely on pre-existing user relationships to pick friend candidates. Regrettably, this advance may not be the most apposite based on topical sociology conclusion. Rules to group people together includes user habit, user attitude, tastes, moral standards, economic level and already known people. This research project deals with the friend-book and semantic based friend recommendation. Here we dealt in basic factors related with the individual users’ personal properties like habit, qualification, profession, skills and economic standard. In this project LDA algorithm is implemented to get 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. The paper has been organized literature review, system design and implementation, system analysis and conclusion.

II. LITERATURE REVIEW

For development and implementation of the project, detailed literature of previous research models in text mining were studied. Z. Wang, J. Liao, Q. Cao, H. Qi and Z. Wang [1] in their manuscript projected a novel semantic-based companion counsel system for social networks, which recommends friends to users based on their life styles instead of social graphs. They modeled a user's daily life as life documents, from which his/her life styles are extracted by using the LDA algorithm. They further proposed 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. S. V. Jose and M. Madhavu [2] in their research paper discovered a similarity metric to quantify the similarity of life styles between users as an incremental way, and ascertain user effect as far as ways of life with a similarity matching diagram. They

incorporated LDA algorithm. R. Chenu-Abente, F. Giunchiglia and L. Cernuzzi [3] in their research, proposed a social core a social network engine that implements semantic-based functionalities like semantic annotations, semantic search semantic-enhanced access control and user privacy protection. They integrated social core as part of the Smart-Campus mobile platform. M. Reshma and R. R. Pillai [4] discussed in their paper trust in the people on social networking sites. They analyzed semantics of connection between people connected on social network. H. Dong, W. Wang, K. Huang and F. Coenen [5] propose a novel deep learning-based method for the problem and design an attention-based neural network with semantic-based regularization, which can mimic users' reading and annotation behavior to formulate better document representation, griping the semantic associations amid label.
The network separately models the title and the content of each document and injects an explicit, title-guided attention mechanism into each sentence. Their model with the semantic-based loss regularizes is referred to as the joint multi-label attention network (JMAN).
X. Zhu, L. Zhang, Y. Huang, B. Bai and J. Ma [6] used Term Frequency-Inverse Document Frequency (TF-IDF) model and the Kullback-Leibler divergence (K-L divergence) to combine the semantic and time information of check-in data to make friend recommendations. N. Alnajran, K. Crockett, D. McLean and A. Latham [7] reviewed and evaluated performance of topological, statistical, and hybrid similarity measures, in the context of Twitter analysis. Performance of each measure is compared against a naive keyword-based similarity computation method to assess the significance of semantic computation in capturing the meaning in tweets. Their research highlighted challenges and potential improvement areas for the semantic similarity of tweets, a resource for researchers and practitioners. N. Gu, D. Sun, B. Li and Z. Li [8] proposed a novel sentiment analysis methods based on interaction chain. They organized messages as interaction-chains by taking advantages of the explicit interaction markers in micro blog. Then, interaction-chains were clustered into different topics by comparing the similarity among them. After that, they performed sentiment analysis using semantic-based SBV polarity algorithm. They then proposed two heuristics according to specificities of micro blog. R. Abbasi, G. Rehman, J. Lee, F. M. Riaz and B. Luo [9] focused on the problem of discovering a user's interest over time on twitter. Their model used latent topic variable to indicate the relatedness of the topic with any user. They proposed a Temporal User Topic (TUT) approach which can be considered the text of tweet by any user and time of the tweet. The proposed approach is used to discover topically related Users for different time periods. They showed how the interests and relationships of users are changeovers a time period. M. S. Tajbakhsh and J. Bagherzadeh [10] in their paper defined a new semantic based method to find similarities among short messages. They modeled each short message as a semantic vector which can be used along with any similarity method such as cosine similarity. M. Hassanein, W. Hussein, S. Rady and T. F. Gharib [11] presented an approach for personality traits inference based on text semantic analysis. Different representations of user text combined with several semantic based measures were proposed to predict users' personality through their Facebook status updates. Their results proved that the information content-based measure achieves the best average personality trait prediction with an accuracy of 64%. B. Lang, J. Wang, M. Li and Y. Liu [12] proposed a compound concept semantic similarity (CCSS) calculation method to measure the semantic similarity between compound concepts. They incorporated CCSS with Locality-Sensitive Hashing function and the secure k -Nearest Neighbor proposal, a SCKS scheme. R. Ghawi, M. Schonfeld and J. Pfeffer [13] proposed a semantic-based methodology for Social Network Analysis (SNA). They used semantic technologies, by defining ontology to represent graphs. Their components like nodes, edges or paths, and the structural relationships between these components were part of the study. They used ontological queries to perform computations needed in SNA. Y. Mehta and S. Buch [14] proposed a semantic proximity based data mining process in our framework for the analysis of employment trends using LinkedIn. The data extraction algorithm and semantic based results were presented which describes the real time dataset and its integration with linked data. They compared different linked data formats to evaluate results and identify their format of data expression. The process of social data analytics by integrating background knowledge from global linked data was core concept of their research work. V. Sabeeh, M. Zohdy and R. A. Bashaireh [15] proposed a CNIRI-FS (Contextual Negation Handling and Inherent Relation Identification for Enhanced Feature Selection) model to detect fake information; utilizing Wikipedia to add semantic features and an external enrichment from trusted web pages. A Genetic Algorithm (GA) was used to filter out unreliable features. The optimal feature set along with the negation handled features is validated using machine learning classifiers. The CNIRI-FS model results showed higher precision and accuracy than a model without optimal feature selection. A. Yadav, R. Sharma and F. H. Fard [16] in their paper proposed a framework to analyze the users' feedback by embedding their semantics. Their initial results showed that framework can automatically measure the semantic differences among users' comments. They said that framework can be used to build intelligent tools to integrate the users' feedback from other platforms, providing ways to analyze the reviews in more detail automatically. X. Gu, H. Yang, J. Tang and J. Zhang [17] they focused on the problem of Web user profiling in the big data era, trying to deal with the new challenges. They proposed a Markov logic factor graph (MagicFG) model to describe human knowledge logics and combine the logics into the extraction model. S. Lalithsena, P. Kapanipathi and A. Sheth [18] in their study they present an approach to identify a minimal domain-specific sub-graph by utilizing statistic and semantic-based metrics. That highlighted the importance of relationships as an element to capture the domain specificity of a sub-graph. They demonstrated its applicability for recommendation.

III. DESIGN AND IMPLEMENTATION

There are some rules to group people together include. We implemented rules like habits of users, user attitude, tastes, moral standards, economic level and people they already know. [7] The reason was, if we could gather information on users' daily routines and activities, we can exploit these rules and recommend friends to people based on their similar pattern. This recommendation mechanism is deployed as a standalone app on smart-phones or as an add-on to existing social network frameworks. [15] In both cases, Friend-book will help mobile phone users find friends either among strangers or within a certain group as long as they share similar life styles. In this paper, we use these properties of user profile like habit, qualification, profession, skills and economic standard. We presented a similarity metrics between people's making friends based on these points or factors to be specific. Our solution is a need of the hour because of the recent development in smart-phones, which are now essential part of people's lives.

These smart-phones are capable of handling GPS, microphone, camera, etc. Thus, a smart-phone is no longer basically a communication gadget, but also a influential and environmental authenticity sensing platform from which we can extort rich circumstance and content-aware information. [3] Smart-phones are good platform for sensing people's way of making friends on social media. We used Latent Dirichlet Algorithm (LDA) for our model of friend-book management. This is an allocation algorithm. As depicted in fig 1, the flow of our project would be from user to user. It shall also have an admin module to administer the working. The factors those considered are chosen as per the user. In this case we are concentrating on habit, activity, profession, skill and qualification. LDA extract the required parameters and shall rank the user in similarity metrics. This metrics based system shall be helpful to the user and could play a smart recommendation system.

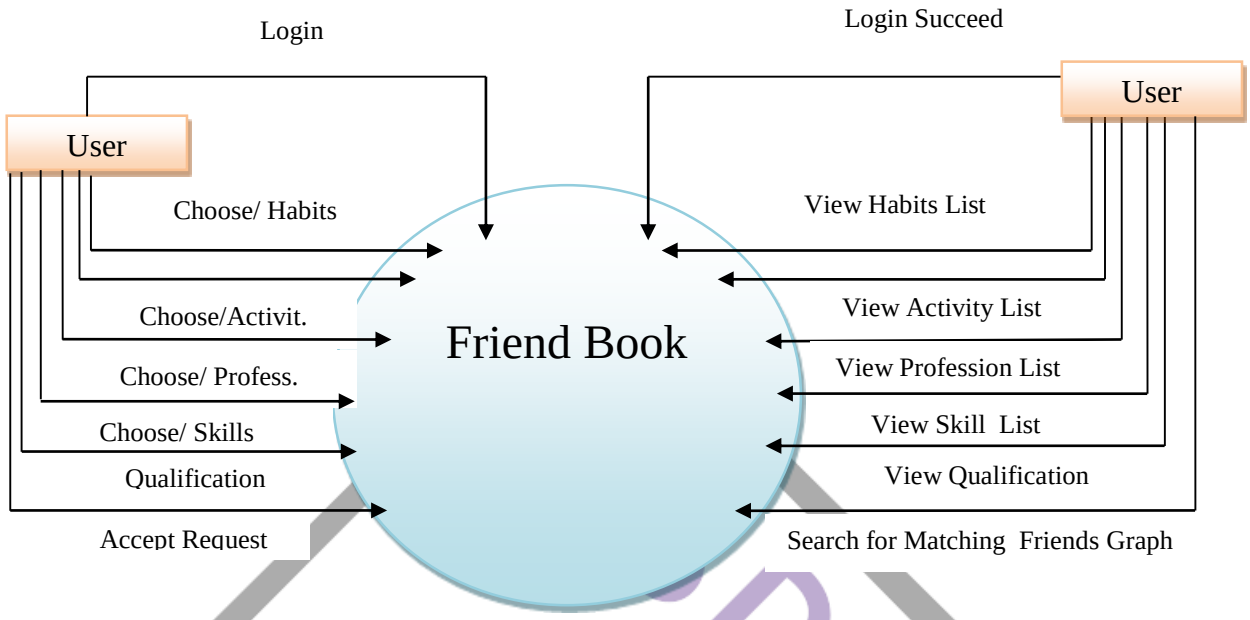


Fig 1: Data Flow Diagram of User

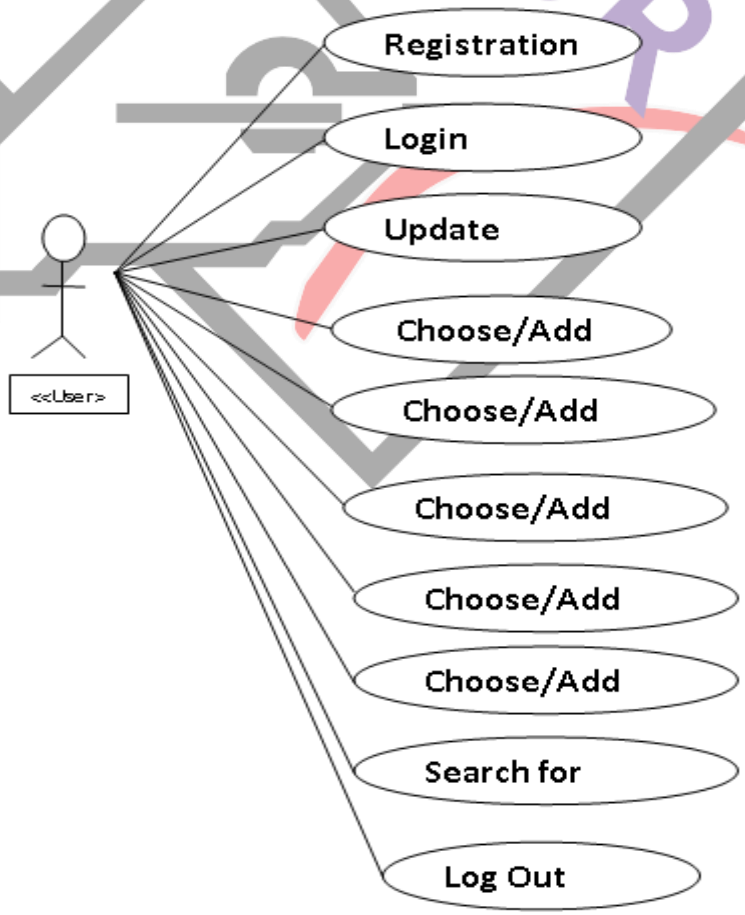


Fig 2: Use Case Diagram of User

As shown in fig 2, it represents a use case diagram of the project implementation Users is dealing with different parameters like search matches, update profile, etc. other than those used in project. Friend-book is an important friend recommendation system exploiting a user's life style information discovered from smart-phone sensors. With the help of text mining, we can model friendship pattern of users. We propose a common pattern to characterize the similarity of users in terms of different factors and then construct a friend-matching similarity metrics to recommend friends to users based on these factors. We assimilate a linear criticism method that exploit the user's feedback to recover counsel accurateness. The screenshots of the project windows are attached in Appendices below.

IV. System Analysis

Project is a model implementing LDA algorithm for feature extraction in text mining. The parameter discussed above are extracted and based on those values, we get a similarity metric which measures similarity life style with a friends matching graph. Besides matching user blocking feature is also incorporated in the project. Bothe the users and admin can analyze each other's matching points before updating friends request. This is a unique feature that was added in the project. All previous researchers only worked for one super user, but we extended their work to multiple users. The data depicted in tables 1-5 and Appendix I, is experimental data taken from Facebook log. There is ranking point related with each person depending upon the topic of research.

Table 1: Habit matching of User (Scott from Appendix I)

Email	First Name	Last Name	Gender	Country	User Impact
nishi@gmail.com	Nishi	Verma	Female	India	**1**
rahul@gmail.com	Rahul	Shirwadkar	Male	India	**2**
ranjit@gmail.com	Ranjit	Bhosle	Male	India	**2**
tiger@gmail.com	Tiger	Tiger	Male	India	**5**

(Ranking out of 5)

Table 2: Qualification matching of User (Scott from Appendix I)

Email	First Name	Last Name	Gender	Country	User Impact
tiger@gmail.com	Tiger	Tiger	Male	India	**5**
lakhan@gmail.com	Lakhan	Salwe	Male	India	**1**
kailash@gmail.com	Kailash	Thate	Male	India	**1**

(Ranking out of 5)

Table 3: Profession matching of User (Scott from Appendix I)

Email	First Name	Last Name	Gender	Country	User Impact
apeksha@gmail.com	Apeksha	Sen	Female	India	**2**
ranjit@gmail.com	Ranjit	Bhosle	Male	India	**2**
satish@gmail.com	Satish	Patil	Male	India	**2**
tiger@gmail.com	Tiger	Tiger	Male	India	**5**

(Ranking out of 5)

Table 4: Skill matching of User (Scott from Appendix I)

Email	First Name	Last Name	Gender	Country	User Impact
apeksha@gmail.com	Apeksha	Sen	Female	India	**2**
tiger@gmail.com	Tiger	Tiger	Male	India	**5**

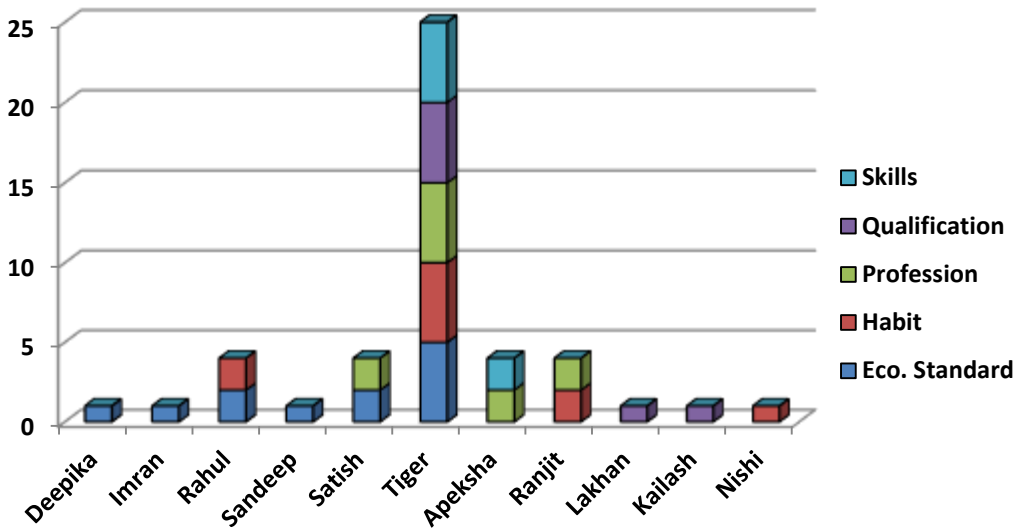
(Ranking out of 5)

Table 5: Economic standard matching of User (Scott from Appendix I)

Email	First Name	Last Name	Gender	Country	User Impact
deepika@gmail.com	Deepika	Jadhav	Female	India	**1**
imran@gmail.com	Imran	Patel	Male	India	**1**
rahul@gmail.com	Rahul	Shirwadkar	Male	India	**2**
sandeep@gmail.com	Sandeep	Joshi	Male	India	**1**
satish@gmail.com	Satish	Patil	Male	India	**2**
tiger@gmail.com	Tiger	Tiger	Male	India	**5**

(Ranking out of 5)

The data as shown in appendix I belongs to 20 different users from Facebook log. The matching was done for user "Scott" from appendix I and compared with all 20 entries of the table. We received the output as depicted in table 1 to 5 depending on different topics of the study. Graphically it can be shown as presented in chart 1 below. This chart shows that each of the members of the friend book can be compared with the credentials of Scott. On analysis we got in result as per chart 1.



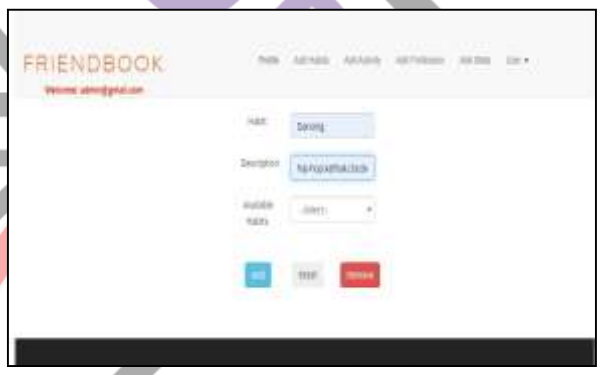
(Note: Ranking out of 5per topic accumulating to 25)

Chart 1: Analysis graph for matching based on ranking of topic.

V. RESULTS AND DISCUSSION

(a) User Registration

(b) Add Habits (Master entry)



(c) Allow / Block user

(d) User Profile

(e) Match Friend Graph

(f) View Request

VI. Conclusion

In this paper, we presented the design and implementation of Friend-book, a semantic-based friend recommendation system for social networks. We implemented Friend-book on the Android-based smart-phones. The results we received are accurate recommendations reflecting preferences of users in choosing friends. First, we evaluate our system on real field experiments.We employ the life style withdrawal using LDA and the iterative matrix-vector development technique in user collision ranking incrementally, so that Friend-book would be scalable to large-scale classification. Finally, the similarity threshold used for the friend-matching graph is fixed. We incorporated Friend-book into existing social services so that Friend-book can utilize more information for life discovery, which improved the recommendation experience.

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