

User Behavior Based Friend Recommendation in Facebook Social Networks

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Abstract—Social Network provides different applications like Facebook, Twitter, Skype and Instagram through which different users can use them and share their thoughts, images, videos and feelings with their friends. It is very difficult for a user to recommend friends to other new users. In this paper a survey of existing friend recommendation techniques such as Match maker, content based and geographical based recommendation has been presented after that this paper provides mechanism how a friend will be recommended to new user in Facebook social network.

Keywords—Social Network, Recommendation, Facebook, Content based recommendation, and community.

I. INTRODUCTION

Social networks can be considered as a development in the web history with the progress in online social life. A social network is "an arrangement of individuals (or associations or other social substances) associated by an arrangement of social connections, for example, friendship, collaborating or data exchange." Social Networking destinations like Facebook concentrate on building and mirroring the social networking and connections among the group having comparative interests [1]. Facebook demonstrated enormous changes in the way how individuals conveyed and associated with each other. What's more, basically the friends are recommended in light of the past existing connections and pick among them as friends for instance, Facebook makes utilization of social connection examination among the individuals who as of now share common friends and recommends symmetrical clients as regular friends and interface individuals the nation over [2].

Social networking destinations have tremendous informational index of clients, as per the present.

Each individual social networking site makes record of the exercises of clients, for example, his/her preferences, likes, activities they are doing and so on and it has increased primary territory of center in understanding the client conduct. One of the best cases we should seriously mull over is Facebook [3].

Henceforth here, in this paper we are influencing utilization of client life to style as real worry for recommending friends and fabricate relationship among the general population with comparable intrigue and help to share data or manufacture correspondence among likely disapproved of individuals.

With Graph API gave by Facebook engineers we separate client intrigue which has a tendency to find way of life of client. The settings may likewise incorporate data like subject of interests, diversions, calling, and so on the data about the client intrigue and his/her calling can be utilized to recommend friends.

Logical data has been perceived by researchers and professionals in numerous disciplines including Ecommerce, customized IR, pervasive and mobile figuring, information mining, advertising and management. There are many existing e-commerce websites which have actualized recommendation systems effectively. Maybe a couple of the recommending systems have been depicted in the following part. Inspired by content mining, we consider client profile as life record, where we treat client exercises (example: watching) as words in life archive, and subjects (example: movie) as way of life and report is dealt with as life document containing day by day lives of client. illustration: if user A has enthusiasm for motion pictures and client B has enthusiasm for sports, and client C intrigue is motion pictures then the client A is interested in making friend with client C at that point contrasted with client B. As user A and client C share comparable way of life so the client C is recommended as friend to client A. The present setting has a real measurement on individual setting (case: topic of intrigue, side interests, calling, and so forth.) with information about the movement in which the client is at present involved (e.g. doing sport, working, and so forth.) can be removed with help of Graph API on Facebook [4].

II. RECOMMENDATION

Recommended frameworks help clients to distinguish their interests and set the decisions by foreseeing the convenience level of a thing or gathering of things to these clients. This framework characterized as an uncommon sort of data about which things may enthusiasm to clients. Recommendation frameworks can be separated into two territories i.e. protest recommendation and connection recommendation. Social networking locales, for example, Facebook and Twitter concentrate on connect recommendation where friend recommendations are exhibited to users. The most imperative target of recommended frameworks is to assess the evaluations for the things that are new for a client [5]. At last, in the wake of computing the evaluated rates for the yet unrated things, a requested rundown of most related things can be arranged and proposed to the objective client.

III. EXISTING SYSTEM

Online social networks have turned out to be critical centers of social action and conductors of data. Prevalent social networking locales, for example, Facebook, the social news aggregator Digg, and the microblogging administration Twitter have experienced touchy development. Hence, this propelled to manufacture the structure of recommending friend with comparative intrigue. With the quantities of dynamic users on these locales numbering in the millions or even many millions, distinguishing a people with comparable enthusiasm among them turns into an essential issue with application in showcasing, data scattering, inquiry, and mastery disclosure. Recommender Systems are programming apparatuses and methods giving proposals to things to be useful to a user [6].

In the current framework, many recommending frameworks have their own proposed structure for relegating positions to the user exercises and having different customized recommendation. For example, Netflix for motion picture recommendation, Foursquare to recommend places, Facebook for recommending friend in view of shared friends. In which recommending friend in view of common friends isn't that proper, these are the different detriments that spurred us to propose new framework.

In this paper we considered Facebook for removing the user subtle elements, for example, name, intrigue, email id and so on and we have broke down its structure. From our investigation point of view one of the vital elements of this network is user premium. User intrigue is the procedure by which considerations and activities of individual are produced and portrayed in their profile and can investigate on it to distinguish his/her way of life. This can be generally acknowledged in social networks.

IV. EXISTING TECHNIQUES

- **MatchMaker:** It is an automated collaborative filtering based mechanism which recommends friends based on

similarity with the TV actors. This technique was applied on Facebook.

Drawbacks: It is just a personality matching system and ignores proximity matching. Also it is not adaptable on user-server systems [7].

- **Content-based Recommendation:** In this type of recommendation system, keywords are used to describe the items and a user profile is built to indicate the type of item this user likes. It tries to recommend items that are similar to those that a user liked in the past. Some movie recommendation algorithms using content-based filtering are: Rotten Tomatoes, Internet Movie Database etc.

Drawbacks: In content-based recommendation system, users' past likes and interests are taken into account. It assumes that the behavior of users does not change with the time. Prediction is based totally on the past history. Thus the change of interests of users has not been taken into account [8].

- **Geographical Recommendation:** In this an efficient and personalized geographic location framework for recommendation called iGeoRec was proposed. In geographical In this type of recommendation systems, users that live geographically close to each other are recommended to each other while those far apart have very chance of recommendation to each other.

Drawback: Geographical Recommendation system does not take into account users' likes and dislikes. Only close users are recommended whereas those far apart are not. It may be the chance that far users tend to be good friends based on their common likes and dislikes [9].

V. PROPOSED WORK

In this paper we propose a mechanism to recommend friends to new users. When a user creates its own new account then it is very difficult to find friends of similar interests to overcome this kind of problem in this paper a friend recommendation framework has been discussed. In proposed framework collect real dataset from Facebook and then recognize features of each user like interest of user, education of user, work place of user and current location of user. After extracting features assign some rating of each user. When a user got some high rating then it will be recommended to new user otherwise not. The proposed framework can be applied on any social network application such as twitter, Facebook, Instagram and Myspace.

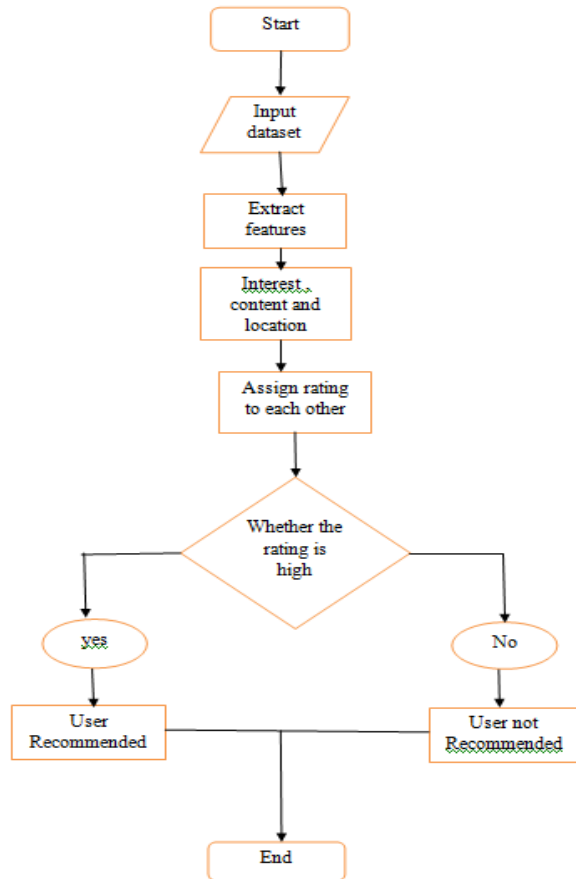


Figure 1 proposed framework

VI RELATED WORK

Zhang [10] proposed a Global Relationship Model (GRM) to get the relationship quality among customers and then build up a seeking system, specifically I-Search, to find the ideal social way between any two users who are truly related in heterogeneous SNSs. They surveyed the execution of P2P-iSN and show that their P2P-iSN can successfully bolster various future applications, for instance, upgraded trust/notoriety measurements and integrated content-sharing. With the proposed P2P-iSN, SNS engineers can plan more powerful user driven SNS applications.

Linet al.[11] played out a substantial scale concentrate to assess precisely how extreme the security spillage issue is in Facebook. As a contextual investigation, creators focus on assessing birth year, which was a critical human property and, for some individuals, a private one. To evaluate Facebook customers' ages, they mishandle the essential social network structure to plot an iterative algorithm, which decides age gauges in view of friends' ages, friends of friends' ages, and so forth. They find that for most users, including very private customers who conceal their friend records, it is conceivable to survey ages with a blunder of just a few of years, moreover make a specific proposition to Facebook which, if actualized, would enormously lessen

privacy leakages in its administration. Moreover Dhekanee et al.[12] concocted a model for the Federated Network fixated on a user and utilize it to portray the issue of Friend Finding. The arrangement uses two phases, first known as Quick Connect which tries to find old acquaintances. The second stage, Delayed Connect uses the Social Graph of Users to discover forthcoming friends. They indicate how the FSN information spun around a User can be removed from FOAF sections and make new recommendations. Similarly, Kim et al. [13] considered the specific issue of how customers can safely confirm online personalities (e.g., associate a Facebook ID with its proprietor). In view of earlier social science explore demonstrating that the social tie quality is a helpful indicator of trust in some genuine connections, they examine how quality can be imagined using well defined and quantifiable parameters. They at that point apply the perception with regards to online friend solicitations and propose a convention for secure online character validation. They in like manner present a usage on a prevalent online social network. Similarly, Squicciarini et al.[14], proposed PriMa (Privacy Manager), a security assurance component that backings semi automated age of access rules for customers' profile information, filling the hole between the security administration needs of SN customers and the current SNS' protection insurance systems. PriMa got to rules are created using a multicriteria calculation, in order to represent a broad arrangement of criteria to be considered when managing access control in SN sites.

VII. RESULTS AND ANALYSIS

Gephi: Gephi is an open source software for visualizing and analyzing for large network graphs. It runs on windows, MAC OS X and Linux. It uses 3D render engine to display large graphs in real time and to speedup the exploration. Gephi is based on a visualize and manipulate paradigm which allow any user to discover networks and data properties.

Metrics used: Gephi offers a wide variety of metrics for exploring graphs. These metrics allow users to explore graphs from various perspectives. There are different kinds of metrics are used like Average Degree, Average Weighted Degree, Page Rank, Modularity. These metrics are found from the real data set from the facebook page and copy the link of this page into the google then find facebook my ID so our facebook ID generate and after that search for the Netvizz and copy the link then after choose the retrieval data date .

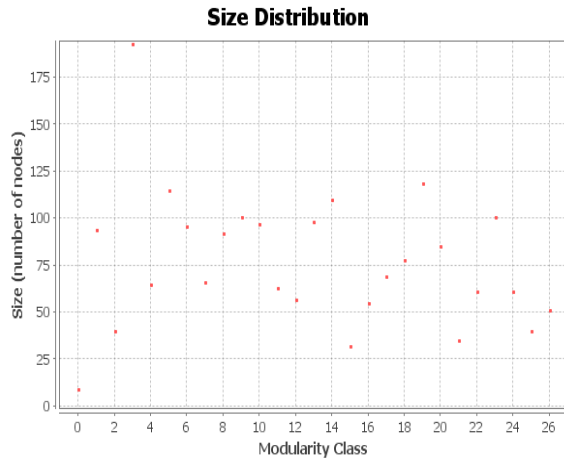


Figure 2 Modularity Classes

Fig 2 shows modularity of classes. Modularity is the fraction of edges that fall within the given groups minus the expected fraction if edges were distributed at random.

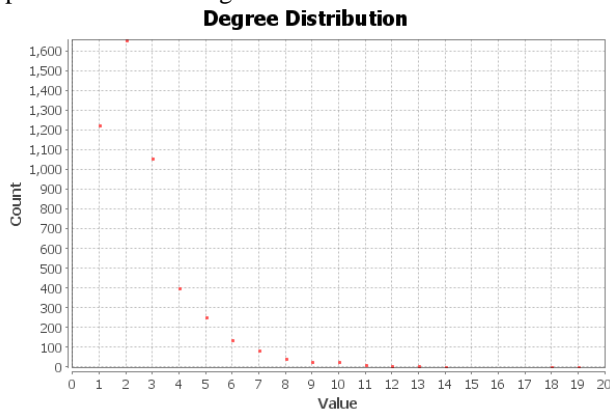


Figure 3 Degree Distribution

Fig 3 shows degree distribution of nodes. The degree of a node in the graph is defined as the number of edges that are incident on that node. The edges have the same node as their starting and end point are counted twice.

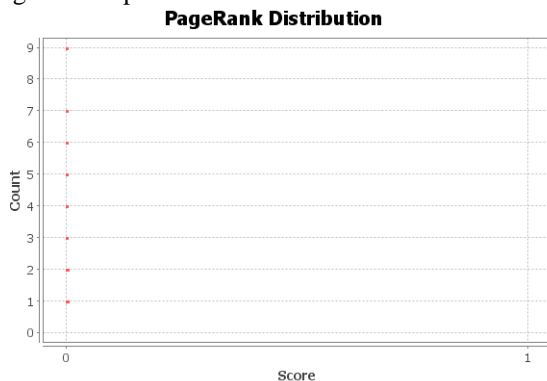


Figure 4 page rank distribution

Fig 4 shows page rank distribution. Page Rank is a calculation which evaluates the quality and quantity of links to a webpage to determine the relative score of that pages importance and authority.

VIII. CONCLUSION

Friend recommendation helps new users to make friends based on their interest. It is difficult to recommend friends on the basis of their interests and their similar patterns. There are various techniques of friend recommendation. In this paper these techniques like matchmaker, content based and geographical are presented with their pros and cons. The matchmaker technique recommends based on the friends on the similarity whereas content based recommends items that are similar to those that a user liked in the past. The last technique is geographical which recommends the friends based on the location. In future try to propose novel mechanism to recommend friends on the basis of user interests, location and their past history.

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