IJARCCE
ISSN (Online) 2278-1021
ISSN (Print) 2319 5940
International Journal of Advanced Research in Computer and Communication Engineering
Vol. 5, Issue 5, May 2016

Personalized Recommendation System Using Social Networking and User Interest

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Abstract: To find interesting and relevant items or products there is one tool Recommendation System (RS). On the social network site people are interested to share their experience, such as reviews, rating etc. about any items or products, which helps to recommend the items to user interest. In this paper, we discussed importance of Recommendation Systems, various social factors, user interest and methodologies, which influence Personalized Recommendation System. To understand the social networking and user interest can help in creating better models of preference and lead to more effective personalization strategies.

Keywords: Personalized Recommendation System, social network, user interest, matrix factorization.

I. INTRODUCTION

Recommendation system (RS) has been effectively used to take care of issue overpowering. normal organizations such as Facebook, twitter are taking care of extensive size of data by prescribing client intrigued things and items. RS has extensive variety of utilizations, for example, research articles, new social labels, motion pictures, music and so forth. As indicated by the client info and diverse trait things can be prescribed, which is firmly identified with client interest.

Study demonstrates that more than 25% of offers created through suggestion. More than 90% people groups trust that items suggested by companion are helpful what's more; half individuals purchase the suggested items or things of their advantage. Google+ presented "Friends Circle" to channel the contacts as per distinctive exercises and systems which helps clients to be closer to their companions. In an extensive web space, suggestion discovers things of client interest. Community oriented sifting and substance based separating are generally utilized systems for suggestion. For Data Mining works icy begin has been a difficult issue. Despite the fact that we have numerous calculations to chip away at Data Mining, icy begin has made individuals to venture back in dissecting the usefulness of those calculations lead to little abatement in innovativeness and advancements in information mining algorithms .Cool begin can be depicted as inaccessibility of information for demonstrating calculations.

Web is constantly alert, so it exceptionally troublesome to foresee the client intrigued things in time.

Personalized RS constitutes elements, for example, interpersonal interest, individual's advantage and interpersonal impact Customized RS is useful to prescribe the things on social systems with the point that prescribed things should in light of their authentic conduct and interpersonal Relationship of social systems. The undeniably well-known online social systems give extra data to improve unadulterated rating-based RS Suggestion in conventional system concentrates on pair of (purchaser, thing) though social proposal concentrates on triplet (vender, purchaser, thing) which upgrades the more fitting things of client interest The nature of the proposal can be accomplished with the assistance of client interpersonal enthusiasm for social system A few social-trust based RS have as of late been proposed to enhance suggestion precision. The interpersonal relationship in the companion's circle of social systems and social connections serves to take care of cool begin and sparsity issue.

II. RELATED WORK

Here we focus on recommended system with consideration of factors of social network. In the following points, we briefly analyse some related works to of recommendation system, which is the basic matrix factorization model [4] without any social factors like social networking, the CircleCon model [1] with the factor of interpersonal trust values and the Social Contextual (ContextMF) model [2] with individual preference and interpersonal influence.

Basic Matrix Factorization:
The task of Recommendation System is to decrease the error of predicted value to the real rating value. Thus, the BaseMF model is work on the observed rating data and review of user by minimizing the objective function. This depends on the probabilistic matrix factorization which utilizes the low rank matrix. The probabilistic matrix factorization is to divide the given matrix M into the product of several factor matrices, i.e. M= S1S2…Sn where n is number factors, but n is usually 2 or 3. Due to its superior performance in scalability Base matrix factorization has very popular in some years, Whenever connection between variable and observed variable is assessed during the training recommendation can made by figuring conceivable collaboration with every item in

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particular matrix is known as base matrices. Basic matrix factorization is coagulating with the social network data like interpersonal data or rating in recommendation system.

CircleCon Model:
To improve the accuracy of the RS the CircleCon model [2] has been found to outperform BaseMF and SocialMF. The approach concentrates on the component of interpersonal trust in social network. The trust of user-user is organized in the form matrix. Afterword it derive the social network several sub-networks from whole trust relationship, and every circle is identified with a single class of item. CircleCon model can be processed in the accompanying steps [2]. In the First, trust circle inference, this can be related with the aid of different genre (categories) with certain threshold value. Second, trust value assignment, this can be done with equal trust, enterprise based trust and trust splitting. Social contexts coordinated to give more precise results. In a huge scale social network rating and survey review is important; utilizes this model to prescribe the motion pictures to different users based on the user profile. They permit the users to rate and review the movies based on their interest, and gathers the information. CircleCon model gives the large quality [11] of recommendation in social network over large data sets.

ContextMF Model:
It show the significance of social contextual factors like including individual preference and interpersonal influence for item adopting on real data from various social networking like Facebook style datasets. The main work of ContextMF model in [3] is to suggest acceptable items from sender to recipient. Here, the basic factor of interpersonal influence is like to the trust values in CircleCon model [2].Moreover, individual preference is mined from receiver's historical adopted items. Individual preference in ContextMF model has more influence than User appraised items, since it simpler for the prescribed items of our model to be transformed into purchase rate than the adopted items in Facebook style social networks. It is observed that neighbours in the social network have similar interest, Context matrix factorization helps to identify similar interest by training objective function.

Direct neighbours can be distinguished by Bayesian inference which helps to identify user personal interest directly related [1] to rated items. Individual interest and Inter personal interest is considered in context matrix factorization because it is easy to recommend the user interested items in real time. The execution of the cold start is enhanced by half utilizing ContextMF.

III. PROBLEM STATEMENT & IMPLEMENTATION

Develop a recommender system (RS) to solve the sparsity problem and cold start of datasets using user interest and the new factors of social network like interpersonal interest and interpersonal influence with the help of combination of collaborative filtering and content-based filtering.

Recommender systems for automatically suggested items of interest to users have become increasingly essential in fields where mass personalization is highly valued. The famous techniques of such systems are collaborative filtering, content-based filtering and combination of these two techniques but two techniques forms cold-start problem and sparsity problem to user-side problems as well as item-side problems.

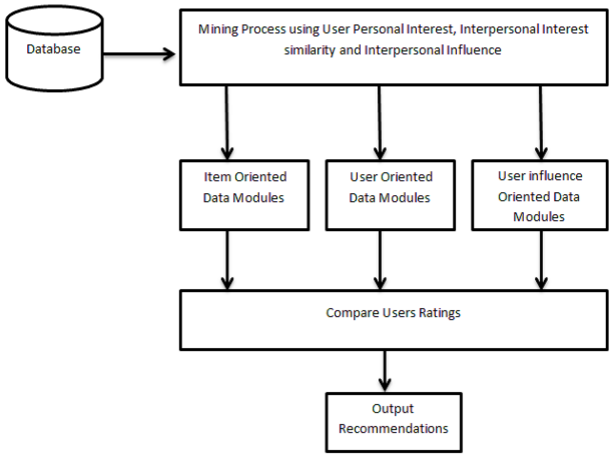

Figure1. System architecture

After careful analysis the system has been identified to have the following modules:
- Social Networks Module
- Interpersonal Influence Module
- Recommendation System Module
- Cold start Filtering Module.

Proposed Modules:

1. Social Networks Module
The capacity to make a Profile page–this is your main "home" on the system An approach to discover and connection to " friends " or connections–The motivation behind a network is associations, so encouraging an individuals' capacity to discover and connect with other individuals is most important. Every network offers distinctive sorts of inquiry abilities and once you've found potential friends; you should send a "friend request "to invite them into your own network profile.

Security Controls–In most systems, your capacity to get to more point by point data around a user depends on their status as one of your associations; "friends" can see substantially more data than the individuals who are not your " friends." You can control who is really in your own system by successfully overseeing who you welcome into your system and whose friends demand you acknowledge.

2. Interpersonal Influence Module
In social network interpersonal Influence; demonstrate that individual preference is significant factor. Just like the idea of interpersonal influence, because of the preference similarity, user latent features ought to be like his or her

IJARCCE

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friends' based on the probabilistic matrix factorization model. To improve the accuracy of RS we use the social factors much effectively integrated in recommendation model. Explored three separate dimensions in designing such a recommender: content sources, topic interest models for users, and social voting. The quality of recommendations gives the results that showing the user's friends consistently provided better recommendations than eight recommender systems. For example 90% of users trust the shopping centre recommended is great from friends, 75% of users trust that the recommendation is valuable from friends. This exploration demonstrates that the interpersonal influence is important factor in in social media had analysed a large social network in a new form of social media known as micro-blogging.

3. Recommendation System Module

Recommender systems or proposal systems (some of the time supplanting "system" with an equivalent word, for example, platform) are a subclass of data filtering system. That try to anticipate the "rating" or "reviews" that client would provide for a thing. The recommender system calculates the list of recommended items for the user by comparing the collected information to similar and dissimilar data collected from the entire user.

4. Cold start Filtering Module

The cold start problem is most predominant in recommender systems. Recommender systems frame a particular type of data filtering (IF) technique that endeavors to present data items like news, pictures that are likely of interest to the client.

In the content-based methodology, the system must be fit for coordinating the attributes of a items against applicable elements in the client's profile. Keeping in mind the end goal to do this, it should first develop an adequately point by point model of the client's tastes and inclinations through inclination elicitation.

In the collaborative filtering approach, the recommender system would distinguish user who have the same inclinations (e.g. rating designs) with the active user, and propose items which the similarly invested clients favoured (and the active user has not yet seen). Because of the cold start problem, this methodology would not able to consider items which nobody in the group has appraised beforehand.

IV. RESULT

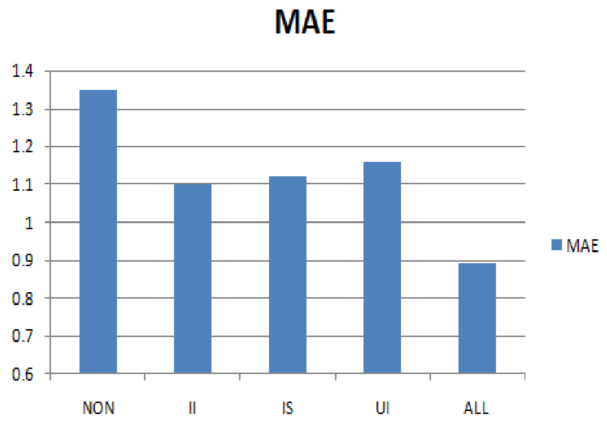
By conducting various experiments on existing models and compare with our personalized recommendation model (PRM)

BaseMF: This model is the basic matrix factorization approach proposed in [4] without consideration of any social factors.

CircleCon: This method includes four factors i.e CircleCon1, CircleCon2a, CircleCon2b, and CircleCon3 to improve the accuracy of BaseMF and SocialMF [3] by introducing the inferred trust circle of social network. And it found that CircleCon2a, CircleCon2b, and CircleCon3 give more accurate recommendation than BaseMF model.

ContextMF: The ContextMF we taking both interpersonal influence and individual preference into consideration and it improve the accuracy of influence-based model in [16], item-based collaborative filtering model in [9].

PRM: The personalized recommendation model (PRM) includes three factors: interpersonal Influence, interpersonal Interest Similarity, user personal interest and it improve the accuracy of recommendation system.



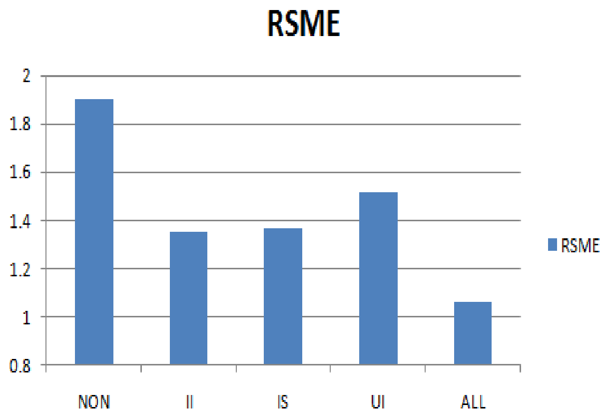


Figure 2. Discussions on the impacts the three factors to recommendation performances of our approach using RS

V. CONCLUSIONS

This paper the different techniques used to build personalized recommendation system using user interest and social network. By reviewing various existing methods used for recommendation techniques it is observed that, in most of the recommendation techniques Cold start problem and Sparsity problem of Data set occurs. So, to overcome these problems we have proposed some modifications in a personalized recommendation technique which is using personal interest and interpersonal interest on social network by base matrix and social matrix factorization will give the accurate recommendations according to user personal interest.

DOI 10.17148/IJARCCE.2016.55116

ACKNOWLEDGEMENT

The completion of any inter-disciplinary project depends upon cooperation, co-ordination and combined efforts of several sources of knowledge. We are grateful to **Prof. Amrit Priydarshi** for his even willingness to give us valuable advice and direction; whenever we approached him with a problem .We are thankful to him for providing immense guidance for this paper

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