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Robust Approach to Generating Location-Sensitive Recommendations in Ad-hoc Social network Environments

C.S. Bakkiya Sankami, T. Sathish Kumar*

Department of Computer Science and Engineering, Vellalar college of Engineering and Technology Erode, Tamilnadu, India.

*Corresponding Author: C.S. Bakkiya Sankami

E-mail: sangami1612@gmail.com

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Abstract

In the current era, the recommendation for the social network applications is very popular and the peoples used those applications from various social networks with their daily interactions with them. At the same time, the user provides feedbacks and comments based on their interests on the interested items when the users perform online shopping. Most of the social networking services did not considering the location information while providing the comments and feedbacks. So that rating, prediction and item recommendation is a challenging issue in the social recommendation. This project proposes Spatial Social Union (SSU), an approach of similarity measurement between two users that integrates the interconnection among users, items and locations. The proposed approach that combines multiple similarity matrices derived from user-item bipartite graph, user-user social graph, and user-location bipartite graph and by implementing the cosine similarity is used for collaborative recommendation. The relationships between user and location are considered and user groups are added for the security purpose. By means of adding a location to a general social network so that the people in the social structure can share location-embedded information by their mobile devices or social network applications. The proposed system presents the age group based similarity measurement.

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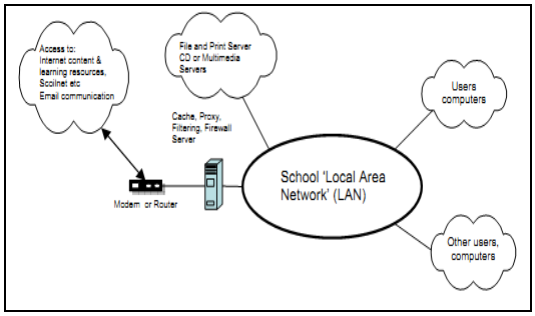
1. Introduction

A computer network consists of a collection of computers, printers and other equipment that is connected together so that they can communicate with each other. Example of a network in a school comprising of a local area network or LAN connecting computers with each other, the internet, and various servers. Broadly speaking, there are two types of network configuration, peer-to-peer networks and client/server networks



1.1. Social Networking

A social networking service (SNS) is a platform to build social networks or social relations among people who share similar interests, activities, backgrounds or real-life connections. A social network service consists of a representation of each user often a profile, his or her social links, and a variety of additional services. Social network sites are web-based services that allow individuals to create a public profile, create a list of users with whom to share connections, and view and cross the connections within the system.

Social network usage

Social Networking has become the following feature, Social networking are the popular trend in modern days. With its immense popularity, small business houses have also started using social networking websites for brand promotion .Today's age is an age of advanced technology. With boon of Internet reaching almost every corner of the world, there has been an immense transformation in each and every field. Be it setting up a better platform of communication or connecting the globe under a common network, Internet has truly contributed in making world much a smaller place to live in.

2. Related Work

Fei Hao, Shuai Li, Geyong Min, Hee- Cheol Kim, Stephen S. Yau, Life Fellow, and Laurence T. Yang project proposed Social recommendation is popular and successful among various urban sustainable applications like products recommendation, online sharing and shopping services**[1].** Users make use of these applications to form several implicit social networks through their daily social interactions. The users in such social networks can rate some interesting items and give comments. The majority of the existing studies investigate the rating prediction

and recommendation of items based on user-item bipartite graph and user-user social graph, so called social recommendation. However, the spatial factor was not considered in their recommendation mechanisms. With the rapid development of the service of location-based social networks, the spatial information gradually affects the quality and correlation of rating and recommendation of items.

This project proposes spatial social union (SSU), an approach of similarity measurement between two users that integrates the interconnection among users, items and locations. The SSU-aware location-sensitive recommendation algorithm is then devised. This project evaluates and compares the proposed approach with the existing rating prediction and item recommendation algorithms. The results show that the proposed SSU-aware recommendation algorithm is more effective in recommending items with the better consideration of user's preference and location.

Symeonidis .P, Tiakas .E, and Manolopoulos project proposed Online Social Rating Networks (SRNs) such as Epinions and Flixter allow users to form several implicit social networks, through their daily interactions like co-commenting on the same products, or similarly co-rating products. The majority of earlier work in Rating Prediction and Recommendation of products (e.g. Collaborative Filtering) mainly takes into account ratings of users on products. However, in SRNs users can also built their explicit social network by adding each other as friends. In this paper, they are propose Social-Union, a method which combines similarity matrices derived from heterogeneous (unipartite and bipartite) explicit or implicit SRNs. Moreover, we propose an effective weighting strategy of SRNs influence based on their structured density. We also generalize our model for combining multiple social networks. The perform an extensive experimental comparison of the proposed method against existing rating prediction and product recommendation algorithms, using synthetic and two real data sets.

In this system introduced a generalized framework that exploits multi-modal social networks to provide item recommendations in SRNs. The performances extensive experimental result is comparison of our method Social-Union, against existing well-known item recommendation algorithms, using a synthetic and two real data sets (pinions and Flirter).In the future, except item recommendations, we indent to apply our framework also for friend recommendations (i.e. Link Prediction). Finally, except uni-partite and bipartite graphs and will extend this framework by incorporating also other higher-order implicit social networks such as tri-partite graphs (e.g. social tagging systems with users, items and tags).

3. Rating Prediction and Recommendation with Spatial Social Union

A social network is a social structure made up of individuals connected by one or more specific types of interdependency, such as friendship, common interests and shared knowledge. Generally, a social networking service builds on and reflects the real-life social networks among people through online platforms such as a website, providing ways for users to share ideas, activities, events, and interests over the Internet.

User experience research is increasingly attracting researchers' attention in the recommender system community. Thus evaluating user's perception of a recommender system can help developers and marketers

understand more precisely if users actually experience and appreciate the intended benefits. This will, in turn, help improve the various aspects of the system and more accurately predict the adoption of a particular recommender. So far, previous research work on recommender system evaluation has mainly focused on algorithm accuracy especially objective prediction accuracy. The new services not only consider social relevance for its users, but they also consider spatial relevance.

3.1 Profile updates

As in typical social networking systems, users can update their personal information, their friend list, or accept a friend invitation from others. A new message: Users can post spatial messages to be seen by their friends, if relevant. A spatial message is represented by the tuple: (Message ID, Content, Timestamp, Spatial), where Message ID and Content represent the message identifier and contents, respectively, Timestamp is the time the message is generated, while Spatial indicates the spatial range for which the message is effective. The message is deemed relevant to only those users who are located within its spatial range.

3.2 A new rating

Users can give location-aware (spatial) ratings to various items in a scale from one to five. Location-aware (spatial) ratings can take any of these three forms: (1) Spatial ratings for non-spatial items, represented as a four-tuple (user, user Location, rating, item). Projection of input data derives the user-item bipartite graph and user-location bipartite graph, respectively. Besides, the user-user social graph (G) from the social networks is derived.

- *Similarity measurement*: Based on these derived graphs, similarity matrices between users can be constructed as simR (Rating), simA (User) and simD (Location).
- *Similarity aggregation*:It proposes an aggregation union, namely SSU which combines the various similarity matrices simR, simA and simD together and returns the similarity matrix between any two users.
- *Rating prediction and recommendation*: At last, it adopts the finalized similarity matrix to predict the missing ratings and provide the recommendations in terms of similarity.

4. Location Time Sensitive

Similarity measurement mechanism, the proposed study also presents age group based similarity measurement. Here based on users' ages is also taken into study as simA (Age) along with simR (Rating), simA (User) and simD (Location).Rating prediction and recommendation adopts the finalized similarity matrix with including simA to predict the missing ratings and provide the recommendations. In addition, time intervals are taken for matrix calculation.

Only time based selective records are taken from the database and so importance is not given to old products in the market. Based on Time interval based recommendations new products launched in some locations and their recommendations by the application itself are included. Age group wise similarity is also taken into consideration.

Spatial Social Union (SSU) an approach of similarity measurement between two users that integrates the

interconnection among users, items and locations. The SSU-aware location-time sensitive recommendation algorithm is then devised. This project evaluates and compares the proposed approach with the existing rating prediction and item recommendation algorithms. The results show that the proposed SSU-aware recommendation algorithm is more effective in recommending items with the better consideration of user's preference and location and time.

5. Conclusion

This project investigates the rating prediction and generates location-sensitive recommendations in ad-hoc social networks. It presents spatial social union, an approach that combines three types of similarity matrices derived from user-item bipartite graph, user-user social graph as well as user-location bipartite graph. It evaluates and compares the proposed approach to the existing rating prediction and item recommendation algorithms. It shows that the SSU algorithm is more effective in predicting rating of items and recommending items in location-based ad-hoc social networks.

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