IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319 5940

International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 6, Issue 9, September 2017

Analysis of Social Recommendation Model using Data Mining Techniques

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Abstract: Social recommendation is popular and successful between various urban sustainable applications like products recommendation, online sharing and shopping services. 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 several 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 consider 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 paper proposes Index Base Spatial Social union (IB-SSU), an approach of similarity measurement between two users that integrates the interconnection among users, items and locations. The IB-SSU-aware location-sensitive recommendation algorithm is then devised. This paper evaluates and compares the proposed approach with the existing rating prediction and item recommendation algorithms. The results show that the proposed IB-SSU-aware recommendation algorithm is more effective in recommending items with the better consideration of user's preference and location.

Keywords: Rating prediction, recommendation, IB-SSU.

I. INTRODUCTION

A social networking service (SNS) is a platform to make 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 open profile, create a list of users with whom to share connections, and view and cross the connections within the system.

Fig 1.1 Social Networks

The Most social network services are web-based and provide means for users to interact over the Internet, such as e-mail and instant messaging. Social network sites are varied and they incorporate new information and communication tools such as mobile connectivity, photo, video, sharing. The Online community services are sometimes measured a social network service, though in a broader sense, social network service usually means an individual-centered service whereas online community services are group-centered. Social networking sites allow users to share ideas, pictures, posts, activities, events, and interests with people in their network

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USES OF SOCIAL NETWORKING

Social Networking has become the following feature, Social networking are the popular movement in modern days. With its huge popularity, small business houses have also started using social networking websites for brand promotion .Today's age is an age of advanced technology. With benefit 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.

From video chats to Video conferencing, from online marketing to socializing via social media, Internet has truly and surely blessing for the global societies. Social media marketing is (SMM) referred to define certain websites that facilitate inter-personal communication through certain websites where in people can create their own profile page and communicate with friends and associates through online messages or scraps. A user can make a network of friends, create a group, initiate or take part in a group discussion. These Social Media websites became a tool that paved the way for advanced mode of communication between all the networks and internet users.

Fig 1.2 Social Network Usage

The social media sites not only remained a platform to initiate informal dialogues and a facilitator of live messages, but became an integral part of marketing strategies of many a business houses. The application of these sites has extend to business houses that started using the Social Networking sites as a platform to promote their services and create brand awareness. Social Networking soon became a way for brand Marketing and promotion on social sphere, whereby, the enterprises started using these online communities or websites for developing contacts and driving traffic to their respective websites. These social networking websites form the main tool of social media marketing. The most commonly used websites Twitter and Facebook. Facebook is a Social Networking Site which helps friends and colleagues to share dialogues with each other through Wall Posts, Messages and Comments.

Social Networking site, Facebook has more than 350 million members and still counting. This site experiences more than two million clicks per day. Statistics state that users spend an average of 20minutes per day in Facebook. Facebook is one of the lethal tools in SMM and SMO.

- To propose spatial social union (SSU), an approach of similarity measurement between two users that integrates the interconnection among users, items and locations.
- To devise the SSU-aware location-sensitive recommendation algorithm.
- To evaluate and compare the proposed approach with the existing rating prediction and item recommendation algorithms.
- To show that the proposed SSU-aware recommendation algorithm is more effective in recommending items with the better consideration of user's preference and location.
- To take from the database, only time based selective records and so avoid importance to old products in the market.
- To study time interval based recommendations

II. RELATED WORKS

Panagiotis Symeonidi et al [1] describe the 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,

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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.

Claudio Gentile et al [2] describe a novel algorithmic approach to content recommendation based on adaptive clustering of exploration-exploitation ("bandit") strategies. The proposed system provide a sharp regret analysis of this algorithm in a standard stochastic noise setting, demonstrate its scalability properties, and prove its effectiveness on a number of artificial and real-world datasets. Our experiments show a significant increase in prediction performance over state-of-the-art methods for bandit problems. Presenting Personalized content to users is now days a crucial functionality for many online recommendation services. Due to the ever-changing set of available options, these services have to exhibit strong adaptation capabilities when trying to match users' preferences. Coarsely speaking, the underlying systems repeatedly learn a mapping between available content and users, the mapping being based on *context* information (that is, sets of features) which is typically extracted from both users and contents.

Laurynas et al [3] describe a privacy-aware proximity detection service determines if two mobile users are close to each other without requiring them to disclose their exact locations. Existing proposals for such services provide weak privacy, give low accuracy guarantees, incur high communication costs, or lack flexibility in user preferences. We address these shortcomings with a client-server solution for proximity detection, based on encrypted, multi-level partitions of the spatial domain. Proposed service notifies a user if any friend users enter the user's specified area of interest, called the vicinity region. This region, in contrast to related work, can be of any shape and can be flexibly changed on the fly. Encryption and blind evaluation on the server ensures strong privacy, while low communication costs are achieved by an adaptive location-update policy. Experimental results show that the flexible functionality of the proposed solution is provided with low communication cost.

Hao Wang et al [4] describe the problem of recommending new venues to users who participate in location-based social networks (LBSN s). As an increasingly larger number of users partake in LBSN s, the recommendation problem in this setting has attracted significant attention in research and in practical applications. The detailed information about past user behavior that is traced by the LBSN differentiates the problem significantly from its traditional settings. The spatial nature in the past user behavior and also the information about the user social interaction with other users, provide a richer background to build a more accurate and expressive recommendation model.

III. SYSTEM METHODOLOGY

*A. **Social Recommendation***

In social recommendation, rating prediction and item recommendation are two main research issues. For example, for a new customer in E-commerce applications, how to efficiently predict his/her rating for a certain product and recommend some potential interesting products to him/her with social recommendation mechanism is a challenge issue. There has been a number of related work [4] on rating prediction and social recommendation. Recently, Vasuki et al. [20] proposed affiliation/group recommendations based on the friendship network among users, and the affiliation/group network between users and groups. However, their method focused on path counts only and did not exploit other features and network characteristics which can be informative for link formation. In [19] they proposed the recommendation systems with the incorporation of trust and distrust information. The proposed framework was based on matrix factorization with regularization terms constraining the trust and distrust relations between users.
In this paper proposed system to generating the location-sensitive recommendations by rating prediction of items in ad-hoc social network environments and propose spatial social union (SSU), an approach that combines multiple similarity matrices derived from user-item bipartite graph, user-user social graph, and user-location bipartite graph (UL-BG). SSU differs from the Social union [4] because it takes into account not only the relation between user and item as well as the social relationships between users, but also the relationships between user and location.

First, three types of similarity matrices derived from user-item bipartite graph, user-user social graph, and user-location bipartite graph are provided and analyzed. Second, the similarity calculation approach, spatial social union that combines the three similarity matrices together is proposed. Third, we improve the FriendTNS algorithm [3] and devise the SSU-aware location-sensitive recommendation algorithm for items. Last, the proposed SSU-aware location-sensitive recommendation algorithm is evaluated using Movie Lens data set, which is a very popular movie recommendation service. In existing system, the study presents

- **(Projection of input data).** It 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.

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- **(Similarity measurement).** Based on these derived graphs, similarity matrices between users can be constructed as simR (Rating), simA (User) and simD (Location).
- **(Similarity aggregation).** Further, 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.

B. Enhanced Social Recommendation

At present, social recommendations has been successful in various urban sustainable applications such as online sharing, products recommendation and shopping services. These applications allow users 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 have investigated 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. In addition with all the existing system mechanism, the proposed study also presents age group based similarity measurement. Here **Similarity measurement** based on users' ages is also taken into study as simA (Age) along with simR (Rating), simU (User) and simL (Location). And so, 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.

The proposed system has following advantages.

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

IV. CONCLUSION

Through this paper the rating prediction and generates location-sensitive recommendations investigation is carried out in ad-hoc social networks. Spatial social union is presented which is 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. Further, the SSU-aware location-sensitive recommendation algorithm is devised. 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. As the dramatic growth of online social network sites continue, the social recommendation in location-based ad-hoc social networks is broadly used everywhere. From a social sustainable perspective, it plans to develop similar techniques in other urban sustainable applications, e.g. E-health field, to confirm that the approach is universally applicable in various domains.

At present, experimental results show that the SSU algorithm is more effective in predicting rating of items and recommending items in location-based ad-hoc social networks. As the dramatic growth of online social network sites continues, the social recommendation in location-based ad-hoc social networks is widely used everywhere. The following enhancements are should be in future. In future, from a social sustainable perspective, the plan is to develop similar techniques in other applications, e.g. E-commerce field, medical field to confirm that the approach is universally applicable in various domains.

ACKNOWLEDGMENT

My heartfelt gratitude goes to my beloved guide **Mrs. Vijaya keerthana,** Assistant Professor, Department of Computer Science, Vivekanandha College for Women, Tiruchengode, India for dedication and patience in assigning me her valuable advice and efforts during the course of my studies.

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10. E. C.-H. Ngai, M. B. Srivastava, and J. Liu, "Context-aware sensor data dissemination for mobile users in remote areas," in Proc. INFOCOM, 2012, pp. 2711–2715 In addition, if the application is developed as web service, then it can be used in other projects also.

BIOGRAPHIES

Ms. Vaishnavi working as M.Phil Scholar in the Department of Computer Science at Vivekanandha College for Women, Tiruchengode, India. She has obtained her Under Graduate Degree in Computer Application from Vivekanandha college of Arts and Sciences for women, Tiruchengode, India and Master Degree in Computer Application from Vivekanandha Institute of Information and Management Studies, Tiruchengode, India.

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