International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 05 Issue: 03 | Mar-2018 www.irjet.net p-ISSN: 2395-0072

Review on different Recommendation techniques for GRS in online social network

Pooja R. Ghodsad[1], Dr. P. N. Chatur[2]

[1]M. Tech. Scholar, Department of Computer Science and Engineering, Government College of Engineering Amravati (MH) India
[2]Head, Department of Computer Science and Engineering, Government College of Engineering Amravati (MH) India

---

Abstract - *Now a day's people are getting busy in their business/jobs. Today, there is a big variety of different approaches and algorithms of data filtering and recommendations giving. Today, every user of the World Wide Web can purchase almost any item being in any country of the world. The amount of information and items got extremely huge, leading to an information overload. It became a big problem to find what the user is actually looking for. Therefore to help them in searching items on internet we propose a recommender system which recommends items on social networking site considering group members opinion. Two of them became very popular collaborative filtering and content-based filtering. They are used as a base of most modern recommender systems.*

***Key Words*: Recommender model, opinion dynamics, weight matrix, collaborative filtering**

1. INTRODUCTION

Currently, businesses and individuals often face situations in which they have to choose an alternative from a large range of options. This situation is known as information overload. Recommender systems (RSs) are successful tools in personalization that filter relevant items (products or services) according to users preferences to present a reduced list of the most relevant choices, i.e., recommendations. Successful examples of applications are e-learning, e-commerce, e-tourism, etc. The most successful approach for RSs is based on collaborative filtering (CF)[1].

The use of recommender systems has grown immensely in the recent years because of the count of people using internet has grown at an enormous rate. Different websites have been successful in implementing recommender systems. Various techniques like collaborative filtering, content based filtering, knowledge based filtering etc have made recommendation easy and reliable.

1.1 TRADITIONAL RECOMMENDER APPROACHES

A. Content-based filtering:

Content-based recommender systems work with profiles of users that are created at the beginning. A profile has information about a user and his taste. Taste is based on how the user rated items. Generally, when creating a profile, recommender systems make a survey, to get initial information about a user in order to avoid the new-user problem. [2] In the recommendation process, the engine compares the items that were already positively rated by the user with the items he didnt rate and looks for similarities. Those items that are mostly similar to the positively rated ones, will be recommended to the user.

B. Collaborative filtering :

Collaborative filtering became one of the most researched techniques of recommender systems since this approach was mentioned and described by Paul Resnick and Hal Varian in 1997. The idea of collaborative filtering is in finding users in a community that share appreciations. If two users have same or almost same rated items in common, then they have similar tastes. Such users build a group or a so called neighborhood. A user gets recommendations to those items that he/she hasn't rated before, but that were already positively rated by users in his/her neighborhood.

Movies / Users	Titanic	Gladiator	Black Swan	The Fighter	TRON: Legacy
A	8	7	9	10	-
B	9	7	9	9	10
C	9	8	9	8	9

Figure.1.3. Collaborative recommender system example

Going in details of methods of collaborative filtering we can distinguish most popular approaches: user-based, item-based and model-based approaches.

a. User-based approach:

In the user-based approach, the users perform the main role. If certain majority of the customers has the same taste then they join into one group.

Recommendations are given to user based on evaluation of items by other users form the same group, with whom he/she shares common preferences. If the item was positively rated by the community, it will be recommended to the user. Thus in the user-based approach the items that were already rated by the user before play an important role in searching a group that shares appreciations with him.

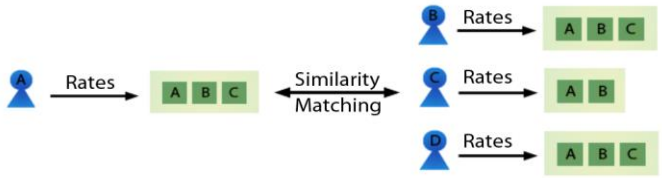

Fig.1.4. User-based collaborative recommender system

b. Item-based approach:

Referring to the fact that the taste of users remains constant or change very slightly similar items build neighborhoods based on appreciations of users. Afterwards the system generates recommendations with items in the neighborhood that a user would prefer.

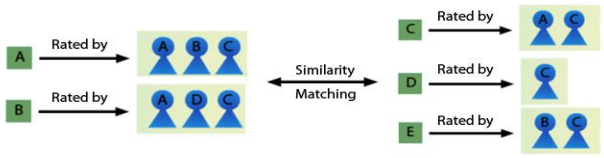

Fig.1.5. Item-based collaborative recommender system

2. RELATED WORK

Raciel Yera Toledo, University of Ciego de Ávila, Morón, Ciego de Ávila, Cuba Yailé Caballero Mota, University of Camagüey, Camagüey, Cuba[1] present programming online judges as particular e-learning scenarios where the inclusion of recommendation functionalities could overcome the information overload associated to the number of users and problems.

JIE LU, QUSAI SHAMBOUR, YISI XU, QING LIN, AND GUANGQUAN ZHANG[2] presents the implementation of the proposed approach into an intelligent recommendation system prototype called Smart BizSeeker, which can recommend relevant business partners to individual business users, particularly for SMBs. Experimental results show that the HFSR approach can help overcome the semantic limitations of classical CF-based recommendation approaches, namely sparsity and new "cold start" item problems.

Dimitrios Rafailidis and Alexandros Nanopoulos[3] presents a user-item interactions over time using a tensor that has time as a dimension (mode). To account for the fact that user preferences change individually, author propose a new measure of user-preference dynamics (UPD) that captures the rate with which the current preferences of each user have been shifted. UPD shows the variability in how users interact with items in recommender systems. Results show that the proposed method out performs several baselines, by taking into account both dynamics and side data of users.

Malak Al-Hassan, Haiyan Lu, Jie Lu[4] paper presents the effectiveness of utilizing semantic knowledge of items to enhance the recommendation quality. It proposes a new Inferential Ontology-based Semantic Similarity (IOBSS) measure to evaluate semantic similarity between items in a specific domain of interest by taking into account their explicit hierarchical relationships, shared attributes and implicit relationships. The paper further proposes a hybrid semantic enhanced recommendation approach by combining the new IOBSS measure and the standard item-based CF approach.

Thi Thanh Sang Nguyen, Hai Yan Lu, and Jie Lu[5] proposes a novel method to efficiently provide better Web-page recommendation through semantic-enhancement by integrating the domain and Web usage knowledge of a website. Two new models are proposed to represent the domain knowledge. The first model uses an ontology to represent the domain knowledge. The second model uses one automatically generated semantic network to represent domain terms, Web-pages, and the relations between them. Another new model, the conceptual prediction model, is proposed to automatically generate a semantic network of the semantic Web usage knowledge, which is the integration of domain knowledge and Web usage knowledge.

José M. Noguera, Manuel J. Barranco, Rafael J. Segura, Luis Martínez [6] present a novel mobile recommender system that brings together a hybrid recommendation engine and a mobile 3D GIS architecture. This system allows tourists to benefit from innovative features such as a 3D map-based interface and real-time location sensitive recommendations. The details related to the design and implementation of the proposed solution are also presented, along with an empirical evaluation of user experience with the mobile application.

Junyu Xuan, Xiangfeng Luo, Guangquan Zhang, Jie Lu, and Zheng Xu[7] propose a framework to identify the different underlying levels of semantic uncertainty in terms of Web events, and then utilize these for Webpage recommendations. Experiments show that the proposed algorithm can significantly capture the different levels of the semantic uncertainties of Web events and it can be applied to Webpage recommendations.

Cataldo Mustoa,*, Giovanni Semeraroa, Pasquale Lopsa, Marco de Gemmisa, Georgios Lekkas[8] This paper proposes a framework for recommendation of asset allocation strategies which combines *case-based reasoning* with a novel diversification strategy to support financial

advisors in the task of proposing diverse and personalized investment portfolios.

Ludovico Boratto1• Salvatore Carta[9] presents a set of group recommender systems that automatically detect groups of users by clustering them, in order to respect a constraint on the maximum number of recommendation lists that can be produced. The proposed systems have been largely evaluated on two real-world datasets and compared with hundreds of experiments and statistical tests, in order to validate the results.

Mike Gartrell, Xinyu Xing, Qin Lv, Aaron Beach, Richard Han, Shivakant Mishra[10] propose a novel group recommendation solution that incorporates both social and content interests of group members. We study the key group characteristics that impact group decisions, and propose a group consensus function that captures the social, expertise, and interest dissimilarity among group members. What is more, we propose a generic framework that can automatically analyze various group characteristics and generate the corresponding group consensus function. Both the consensus function we propose and the generic framework perform well on real-world user studies consisting of groups of various sizes, user interests, and social relationships.

Jorge Castro, Jie Lu, Guangquan Zhang, Yucheng Dong, and Luis Martínez[11] presents a framework to extend opinion dynamics and apply it to GRSs. The proposed framework considers the relationships between members' preferences in recommendations, which improves aggregation. Moreover, the framework ensures consensus in recommendations, which are agreed to by all group members.

Jorge Castro, Jie Lu, Guangquan Zhang, Yucheng Dong, and Luis Martínez[12] proposed a opinion dynamics model in which every group member's preferences are calculated and then on the basis of relation-ship between all the preferences/opinion collected from all members combined preferences will be calculated. The combined preferences will be used to recommend items to complete group. For considers these relationships author use a smart weights matrix to drive the process.

3. CONCLUSIONS

This paper addressed different recommendation techniques that recommend the items to the group of users instead of individual. After reviewing all the above defined recommendation techniques it can be concluded that smart weight matrix is a best way to recommend the items to complete group. In weight matrix, according to the similarity of preferences/opinion or overlapping of experience system will recommend the item. And if opinions do not agree, then weights matrix is modified to reach a consensus value i.e. author used DeGroot model to reaching a consensus or agreement.

REFERENCES:

[1] Algorithms and Methods in Recommender Systems

[2] M. H. DeGroot, "Reaching a consensus," J. Amer. Stat. Assoc., vol. 69, no. 345, pp. 118–121, 1974.

[3] L. Boratto and S. Carta, "Art: Group recommendation approaches for automatically detected groups," Int. J. Mach. Learn. Cybern., vol. 6, no. 6, pp. 953–980, 2015.

[4] F. Ortega, A. Hernando, J. Bobadilla, and J. H. Kang, "Recommending items to group of users using matrix factorization based collaborative filtering," Inf. Sci., vol. 345, pp. 313–324, Jun. 2016.

[5] Jorge Castro, Jie Lu, Guangquan Zhang, Yucheng Dong, and Luis Martínez "Opinion Dynamics-Based Group Recommender Systems" 2168-2216 _c 2017 IEEE Trans.

[6] Wu, J. Lu, and G. Zhang, "A fuzzy tree matching-based personalized e-learning recommender system," IEEE Trans. Fuzzy Syst., vol. 23, no. 6, pp. 2412–2426, Dec. 2015.

[7] Rafailidis and A. Nanopoulos, "Modeling users preference dynamics and side information in recommender systems," IEEE Trans. Syst., Man, Cybern., Syst., vol. 46, no. 6, pp. 782–792, Jun. 2016.

[8] J. Lu, D. Wu, M. Mao, W. Wang, and G. Zhang, "Recommender system application developments: A survey," Decis. Support Syst., vol. 74, pp. 12–32, Jun. 2015.

[9] J. Lu, Q. Shambour, Y. Xu, Q. Lin, and G. Zhang, "A Web-based personalized business partner recommendation system using fuzzy semantic techniques," Comput. Intell., vol. 29, no. 1, pp. 37–69, 2013.

[10] J. Masthoff, "Group recommender systems: Aggregation, satisfaction and group attributes," in Recommender Systems Handbook, F. Ricci, L. Rokach, and B. Shapira, Eds. New York, NY, USA: Springer, 2015, pp. 743–776.

[11] I. Cantador and P. Castells, "Group recommender systems: New perspectives in the social Web," in Recommender Systems for the Social Web. Heidelberg, Germany: Springer, 2012, pp. 139–157.

[12] M. Gartrell et al., "Enhancing group recommendation by incorporating social relationship interactions," in Proc. 16th ACM Int. Conf. Supporting Group Work (GROUP), Sanibel, FL, USA, 2010, pp. 97–106.

[13] Y. Koren, R. Bell, and C. Volinsky, "Matrix factorization techniques for recommender systems," Computer, vol. 42, no. 8, pp. 30–37, Aug. 2009.

[14] Andrei-Cristian Prodan, "Implementation of Recommender System Using Collaborative Filtering", Studia Universitatis Babes-Bolyai, informatica, vol. 55, no. 4, pp. 70-84, 2010.

[15] R. Y. Toledo and Y. C. Mota, "An e-learning collaborative filtering approach to suggest problems to solve in programming online judges," Int. J. Distance Edu. Technol., vol. 12, no. 2, pp. 51–65, 2014.

[16] Jorge Castro, Jie Lu, Guangquan Zhang, Yucheng Dong, and Luis Martínez, "Opinion Dynamics-Based Group Recommender Systems" 2168-2216 _c 2017 IEEE.