

Product Recommendation in cold start situations using Microblogging Information

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Abstract--The boundaries between e-commerce and social networking has become increasingly blurred. Many e-commerce websites support the mechanism of social login where users can sign on the websites using their social network identities such as Facebook or Twitter accounts. Users can also post their newly purchased products on microblogs with links to the e-commerce product web pages. In this methodology, a solution for cross-site cold-start product recommendation to recommend products from e-commerce websites to users in "cold-start" situations. A major challenge is how to leverage knowledge extracted from social networking sites for cross-site cold-start product recommendation. We propose to use the linked users across social networking sites and e-commerce websites as a bridge to map users' social networking features to another feature representation for product recommendation. In specific, learning both users' and products' feature representations from data collected from e-commerce websites using recurrent neural networks and then apply a modified gradient boosting trees method to transform users' social networking features into user embeddings and a feature-based matrix factorization approach which can leverage the learnt user embeddings for product recommendation is used.

Index Terms: product recommender, product demographic, recurrent neural networks.

I. INTRODUCTION

In recent years, the boundaries between e-commerce and social networking have become increasingly blurred. E-commerce websites such as eBay features many of the characteristics of social networks, including real-time status updates and interactions between its buyers and sellers. With the new trend of conducting e-commerce activities on social networking sites, it is important to leverage knowledge extracted from social networking sites for the development of product recommender systems. In this project, an interesting problem of recommending products from e-commerce websites to users at social networking sites who do not have historical purchase records, i.e., in "cold-start" situations is studied. It is called cross-site cold-start product recommendation. The linked users across social networking sites and e-commerce websites as a bridge to map users' social networking features to latent features for product recommendation are proposed. In specific, both users' and products' feature representations from data collected from e-commerce websites using recurrent neural networks and then apply a modified gradient boosting trees method to transform users' social networking features into user embeddings is proposed.

Our proposed framework is indeed effective in addressing the cross-site cold-start product recommendation problem. We formulate a novel problem of recommending products from an e-commerce website to social networking users in "cold-start" situations. We propose to apply the recurrent neural networks for

learning correlated feature representations for both users and products from data collected from an e-commerce website. We propose a modified gradient boosting trees method to transform users micro blogging attributes to latent feature representation which can be easily incorporated for product recommendation. We propose and instantiate a feature-based matrix factorization approach by incorporating user and product features for cold-start product recommendation

II. RELATED WORK

In the existing system user purchase history records were used to recommend products. They only focus on brand or category-level purchase preference based on a trained classifier, which cannot be directly applied to our cross-site cold start product recommendation task. Their features only include gender, age and Facebook likes, as opposed to a wide range of features explored in our approach. They do not consider how to transfer heterogeneous information from social media websites into a form that is ready for use on the e-commerce side, which is the key to address the cross-site cold-start recommendation problem.

Purchase on IT E-commerce Chris Edwards Engineering Technology published the idea wherein nowadays online shopping has achieved a tremendous popularity within very less amount of time. For recommending the users that are totally new to the websites, we use novel solution for cross-site cold-start product recommendation that aims for recommending products from e-commerce websites. In specific, we propose learning both users and products feature representations from data collected from e-commerce websites using recurrent Matrix Factorization to transform user's social networking features into user embeddings. We then develop a feature-based matrix factorization approach which can

manipulate the learnt user implanting for cold-start product recommendation. Using computer networks, such as the Internet or online social networks, facilitation of trading in products or services is nothing but e-Commerce.

A fuzzy approach for multicriteria decision making in web recommendation system for e-commerce by L. Hu, J. Cao, G. Xu, L. Cao, Z. Gu in 2013 as Recommendation systems are used in e-commerce for recommending products to the users. From this paper we took the fuzzy logic and its disadvantages are overcome in our paper with the use of matrix factorization. Current decade has witnessed a rapid growth in ecommerce and related activities. Web recommendation systems are widely used in e-commerce applications for recommending products to the users. In the current scenario selection of any product depends on multiple criteria, hence it has become a problem of multi criteria decision making.

A recommendation scheme utilizing Collaborative Filtering By Telang, R., Boatwright, P., Mukhopadhyay, Internet Technology and Secured Transactions (ICITST), 2013 8th International Conference 13 as Recommendation has many types which are currently in use. We used collaborative filtering approach from this paper. Our objective is to use a set of linked users across both e-commerce websites and social networking sites as a bridge, we can learn feature mapping functions using a modified gradient boosting trees method, which maps users' attributes extracted from social networking sites onto feature representations learned from e-commerce websites. The mapped user features can be effectively incorporated into a feature-based matrix factorisation approach for coldstart product recommendation

III. EXISTING METHOD

In the existing system user purchase history records were used to recommend products. The users who don't have historical records cannot get product recommendation in the existing system. The social network information of users cannot be used for e-commerce system in the existing system.

The users' social networking information is available and it is a challenging task to transform the social networking information into latent user features which can be effectively used for product recommendation.

They only focus on brand or category-level purchase preference based on a trained classifier, which cannot be directly applied to our cross-site cold start product recommendation task. Their features only include gender, age and Facebook likes, as opposed to a wide range of features explored in our approach.

They do not consider how to transfer heterogeneous information from social media websites into a form that is ready for use on the e-commerce side, which is the key to address the cross-site cold-start recommendation problem.

IV PROPOSED SYSTEM

In the proposed system on the e-commerce websites, users and products can be represented in the same latent feature space through feature learning with the recurrent neural networks. Using a set of linked users across both e-commerce websites and social networking sites as a bridge, feature mapping functions can be learned, which maps users' attributes extracted from social networking sites onto feature representations learned from e-commerce websites. We propose to apply the recurrent neural networks for learning correlated feature representations for both

users and products from data collected from an e-commerce website. We propose a modified gradient boosting trees method to transform users' microblogging attributes to latent feature representation which can be easily incorporated for product recommendation.

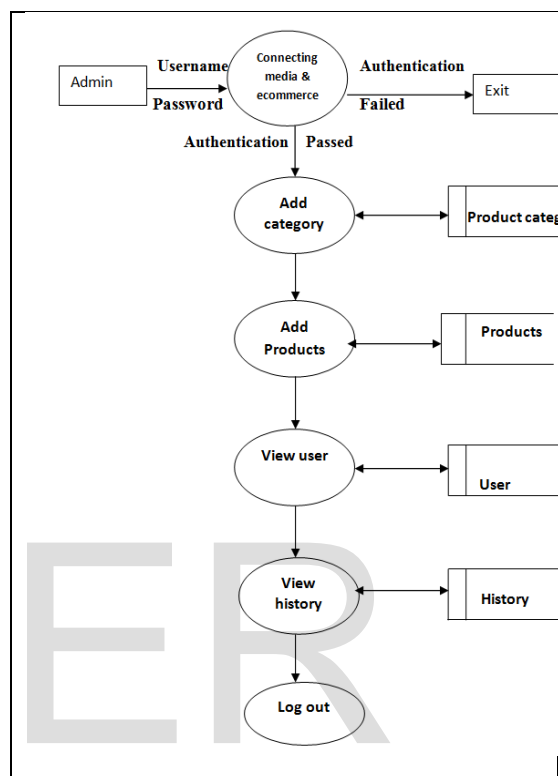


Fig. 4.1 proposed system (Admin)

In the given figure the responsibilities of the administrator are discussed and the functions that are performed by the administrator in order to recommend the appropriate products to the users satisfying their needs are considered.

4.1 MODULE DESCRIPTION

4.1.1 ADMINISTRATOR MODULE Login

The authorized administrator of e-commerce and social media provides the username and password to login in this module.

Add categories

The administrator is able to add new categories of products to the e-commerce site from this module.

Add products

New products are added to the e-commerce site under a predefined category by the administrator in this module.

View user

The administrator can view the registered social media users in this module. The profile of the user along with the purchase history can be viewed here.

View history

The previous search made by the registered users can be viewed by the administrator in this module.

4.1.2. USER MODULE:

Register

This module allows the new user to get registered in the social media by providing the basic necessary information.

Login

The registered users provide their username and password and login in this module to access the social media.

Search friend

In this module the users can find the friends they are looking for in the social media if they have registered in the same media.

Send friend request

The registered social media users can send friend request to the other registered users in this module.

View friend request

The requests received from other users can be viewed in this module. The users can accept or deny the friend request in this module.

Post recommendation

The registered users can send product recommendation to their friends in social media through this module.

View recommendation

The product recommendation sent from friend in the social media can be viewed in this module.

Search products

The users of social media can also search desired products in this module.

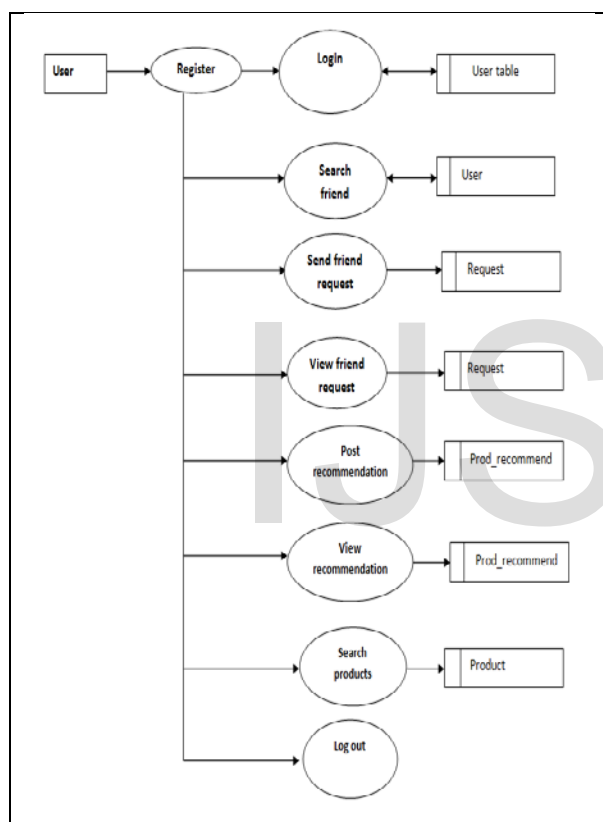


Fig 4.2 Proposed system (user)

Figure 4.2 represents the user privileges that are granted to the user, and about the functions that the user can carry out as in request the products to his/her friends and also receive recommendations from others. In addition users can also search for desired products and thus enabling the admin to go through the users search history and also use that to recommend products.

V RESULTS AND DISCUSSION

Hence in the proposed system the result obtained is different from that of the existing system as the products are recommended not just based on history but also user attributes.

Hence resulting in the outcome of user satisfaction. The major idea is to leverage the knowledge and use it for recommending products, thereby the profile of the users serves as a medium for extracting characteristics about the user and rendering help to recommend products to the user. Thereby we can say the efficiency of the project depends on whether

or not relevant products are recommended to the users.

VI CONCLUSION AND FUTURE SCOPE

In this project only simple neutral network architecture has been employed for user Embeddings as well as product embedding's learning. In the future, more advanced deep learning models such as Convolution Neural Networks can be explored for feature learning. Improving the current feature mapping method through ideas in transferring learning can also be considered to get results that can be more than expected and also to include a real time data site from any of the social networking sites will be worked on.

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