Implementing Product Recommendation System using Neural Network by Connection Social Networking to E-Commerce

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Abstract

Recently, the bounds between e-commerce and social networking have become increasingly blurred. Many e-commerce websites keep the mechanism of social log in where users can to stay the websites using their social media identities like their Facebook or Twitter accounts. Users may also post their newly purchased products on micro-blogs with links on the e-commerce product web pages. Within this paper, we advise a manuscript solution for a cross-site cold-start product recommendation, which aims to recommend products from e-commerce websites to users at social networking sites in "cold-start" situations, an issue that has rarely been explored before. A serious challenge is how you can leverage knowledge extracted from social networking sites for the cross-site cold-start product recommendation.

Keywords: e-commerce, product recommender, product demographic, micro-blogs, 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. Some e-commerce websites also support the mechanism of social login, which allows new users to sign in with their existing login information from social networking services such as Facebook, Twitter or Google+. Both Facebook and Twitter have introduced a new feature last year that allow users to buy products directly from their websites by clicking a “buy” button to purchase items in adverts or other posts. In China, the e-commerce company ALIBABA has made a strategic investment in SINA WEIBO1 where ALIBABA product adverts can be directly delivered to SINA WEIBO users. 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.

We advise making use of the linked users across social networks and e-commerce websites (users who may have social network accounts and possess made purchases on e-commerce websites) as a bridge to map user's social network features to an alternative feature representation for the product recommendation. In specific, we advise learning both user's and item's feature representations (called user embedding’s and product embedding’s, respectively) from data collected from e-commerce websites using recurrent neural networks and then employ a modified gradient boosting trees strategy to transform user's social media features into user embedding’s. Only then do we create a feature-based matrix factorization approach which may leverage the learned user embedding’s for a cold-start product recommendation. Experimental results with a large dataset manufactured from the largest Chinese micro-blogging service SINA WEIBO as well as the largest Chinese B2C e-commerce website JINGDONG show the strength of our proposed framework.

II. LITERATURE SURVEY

A. Opportunity Model for E-Commerce Recommendation: Right Product; Right Time

Author: - J. Wang and Y. Zhang

The majority of existing e-commerce recommender systems try to recommend the right product with a user, determined by whether or not the user is likely to purchase or like a product. Conversely, the potency of recommendations also depends upon the time of the recommendation. Allow us to have a user who just got a new laptop as one example. She may buy a replacement battery by 2 years (if the laptop's original battery often does not deal with that time) and buy a fresh laptop in another 24 months. In cases like this, it is not a good idea to recommend a fresh laptop or a replacement battery soon after the user purchased the new laptop. It could possibly hurt the user's satisfaction in the recommender system if she receives a potentially appropriate product recommendation at the wrong time. We believe that something shouldn't only recommend probably the most relevant item, but additionally recommend at the perfect time.

B. Retail Sales Prediction and Item Recommendations using Customer Demographics at Store Level

Author: - M. Giering

This paper outlines a retail sales prediction and product recommendation system that has been implemented for a chain of stores. The relative need for consumer demographic characteristics for accurately modelling the sales of each one customer type are derived and implemented in the model. Data contained daily sales information for 600 products at the store level, broken out over some non-overlapping customer types. A recommender system was built based on a fast online thin Singular Value Decomposition. It can be shown that modelling data at a finer level of detail by clustering across customer types and demographics yields improved performance rather than a single aggregate model built for the whole dataset. Information the system implementation are described and practical conditions arise in such real-world applications are discussed.

C. Amazon.com Recommendations: Item-to-item Collaborative Filtering

Author: - G. Linden, B. Smith, and J. York

Recommendation algorithms are best known for their use on e-commerce Web sites, where they use input about a customer's interests to generate a list of recommended items. Many applications use only the items that customers purchase and explicitly rate to represent their interests, but they can also use other attributes, including items viewed, demographic data, subject interests, and favourite artists. At Amazon.com, we use recommendation algorithms to personalize the online store for each customer. The store radically changes based on customer interests, showing programming titles to a software engineer and baby toys to a new mother. There are three common approaches to solving the recommendation problem: traditional collaborative filtering, cluster models, and search-based methods. Here, we compare these methods with our algorithm, which we call item-to-item collaborative filtering.

D. The New Demographics and Market Fragmentation

Author: - V. A. Zeitham

The underlying premise of this article is that changing demographics will lead to a splintering of the mass markets for grocery products and supermarkets. A field study investigated the relationships between five demographic factors-sex, female working status, age, income, and marital status-and a wide range of variables associated with preparation for and execution of supermarket shopping. Results indicate that the demographic groups differ in significant ways from the traditional supermarket shopper. Discussion centers on the ways that changing demographics and family roles may affect retailers and manufacturers of grocery products.

E. We Know What You Want to Buy: A Demographic-Based System for Product Recommendation on Microblogs

Author: - W. X. Zhao, Y. Guo, Y. He, H. Jiang, Y. Wu.

Product recommender systems are often deployed by e-commerce websites to improve user experience and increase sales. However, recommendation is limited by the product information hosted in those e-commerce sites and is only triggered when users are performing e-commerce activities. In this paper, we develop a novel product recommender system called METIS, a MErchanT Intelligence recommender System, which detects users' purchase intents from their microblogs in near real-time and makes product recommendation based on matching the users' demographic information extracted from their public profiles with product demographics learned from microblogs and online reviews. METIS distinguishes itself from traditional product recommender systems in the following aspects: 1) METIS was developed based on a microblogging service platform. As such, it is not limited by the information available in any specific e-commerce website. In addition, METIS is able to track users' purchase intents in near real-time and make recommendations accordingly. 2) In METIS, product recommendation is framed as a learning to rank problem. Users' characteristics extracted from their public profiles in microblogs and products' demographics learned from both online product reviews and microblogs are fed into learning to rank algorithms for product recommendation.

III. PROPOSED APPROACH FRAMEWORK AND DESIGN

A. Architectural Design

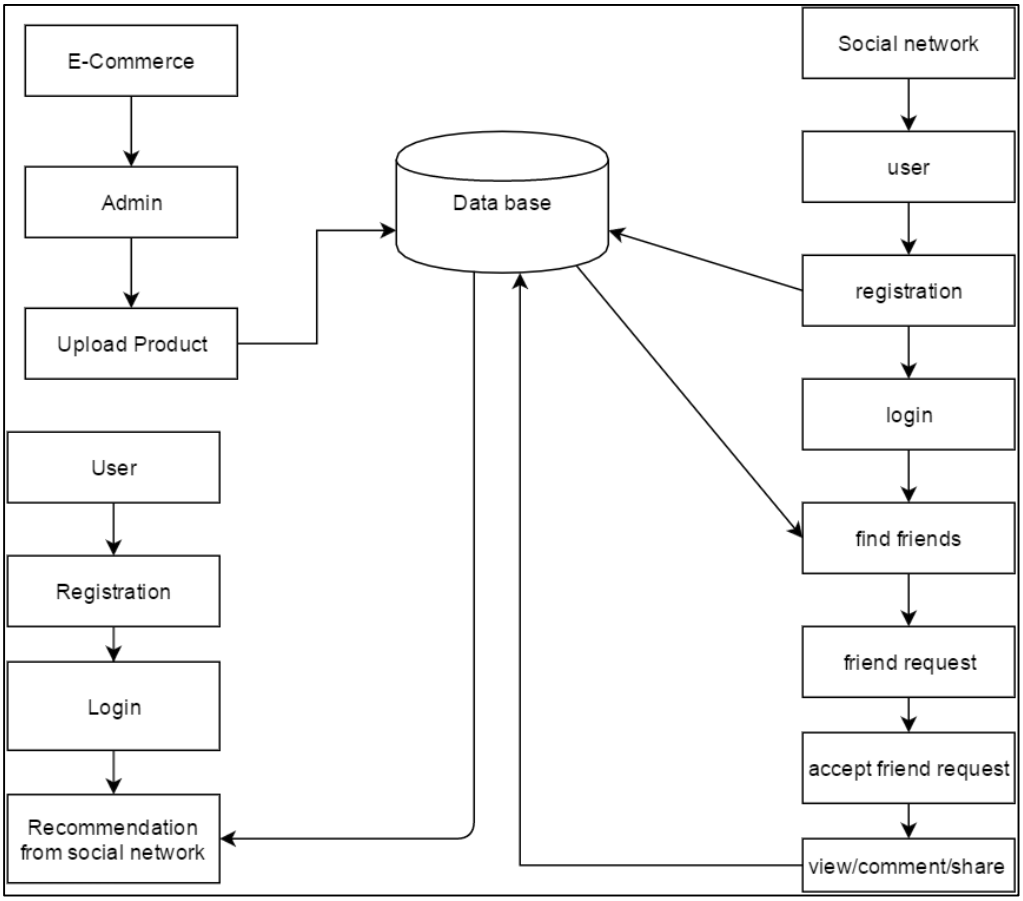

Fig. 1:

With this recommending products from e-commerce websites to users at social networks who don't have historical purchase records, i.e., in situations. This issue cross-site cold-start product recommendation. Although online product recommendation continues to be extensively studied before, most studies only concentrate on constructing solutions within certain e-commerce websites and mainly utilize users historical transaction records. To the very best of our knowledge, cross-site cold-start product recommendation continues to be rarely studied before.

A person Precent social media details are available which is a difficult task to change the social media information into latent user features which may be effectively useful for product recommendation. To deal with this problem, advise to make use of the linked users across social networking sites and e-commerce websites (users that have social media accounts and possess made purchases on e-commerce websites) like a bridge to map social media features to latent features for product recommendation. In specific, learning both and items Precent feature representations (called user embedding's and product embedding's, respectively) from data collected from ecommerce websites using recurrent neural networks after which use a modified gradient boosting trees strategy to transform social media features into user embedding's. Then create a feature based matrix factorization approach which could leverage the learnt user embedding's for cold-start product recommendation. With this concentrates on sentiment analysis, in which the goal is to locate and aggregate sentiment on entities mentioned within reviews.

B. Propose Work:

The area of sentiment analysis, where sentiment is collected, examined, as well as accumulated from message, has actually seen a great deal of interest in the last few years. The matching development of the area has actually resulted in the development of different subareas, each dealing with a different degree of analysis or research study concern. In this concentrates on sentiment analysis, where the objective is to find as well as sentiment on entities pointed out within reviews.

C. Mathematical Model:

Let S is the Whole System Consist of
S= {I, P, O}
I = Input.

I = {SU, EU, A, C, D}
SU = Social Network Users
SU = {su1, su2….sun}
EU= {eu1, eu2… eun}
A= E Commerce Advertisers
A= {a1, a2,…, an}
C = Content of user Profile in Social Network.
C = {c1, c2, c3…cn}
D = Dataset
P = Process:

1) Step1: Advertiser will upload the product in E-commerce site.
2) Step2: Social Networks users will be seen on Social sites where user can view share and give comments on that post. User can send and receive friend request in social network.
3) Step3: Social Network site following attribute is used to recommend product on E commerce site\

1) Demographic Attributes

A demographic profile of an individual such as sex, age as well as education and learning could be made use of by e-commerce business to give much better personalized solutions. Extract individuals' demographic attributes from their public profiles on. Recognize six significant demographic attributes: gender, age, marriage status, education, career as well as interests.

2) Text Attributes

To remove topics from user-generated message utilizing the Latent Dirichlet Allocation (LDA) model for recommendation jobs. Follow the exact same concept, initially accumulated} all the microblogs an individual right into a document a record, and after that run the common LDA to obtain the topic distributions for every individual.

3) Network Attributes

On the internet social media area, it is frequently observed that individuals gotten in touch with each various other (e.g., with following web links) are most likely to share similar interests.

4) Temporal Attributes

Temporal task patterns are likewise considered regular activity distribution of an individual is identified by a circulation between temporal tasks patterns as well as individuals ' purchase preferences.

Step3: Based on this attribute E commerce Product Recommend in E-commerce site when user login to E- commerce site.

a) Output(O):

E Commerce Product Recommendation by solving cold star product recommendation problem with sentiment analysis.

IV. SYSTEM ANALYSIS

Table – 1
Performance of different Algorithm

Algorithm	*Time in Ms*	*No of produces*	*Accuracy*
LDA	*2*	*18*	*60%*
Sentimental Analysis	*6*	*12*	*30%*
Neural Network	*3*	*10*	*70%*

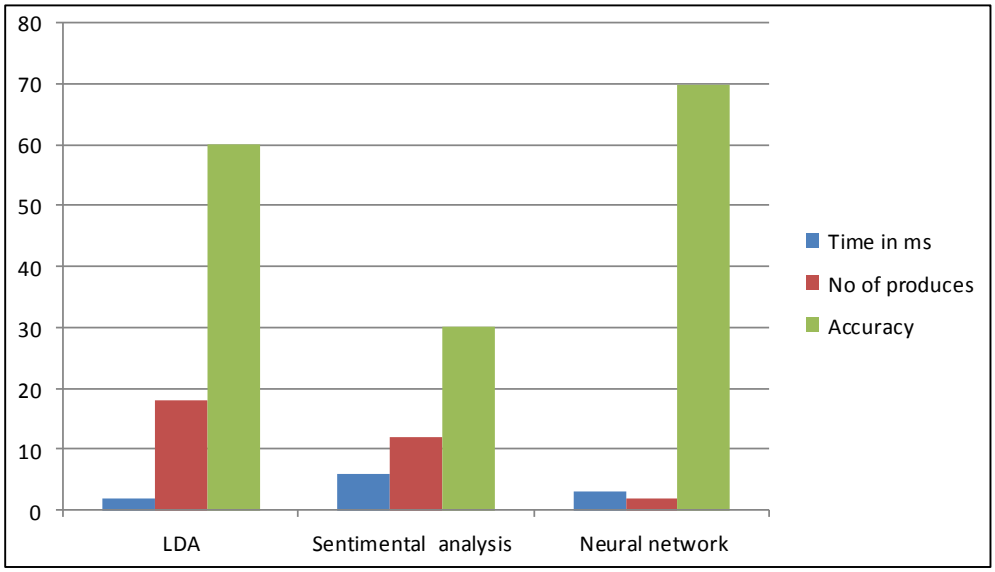

Fig. 2: GRAPH Diagram of Different Algo.

A. Hardware Resources Required

- System : Pentium IV 2.4 GHz.
- Hard Disk : 40 GB.
- Floppy Drive : 1.44 Mb.
- Monitor : 15 VGA Colour.
- Mouse : Logitech.
- Ram : 512 Mb.

B. Software Resources Required

- Operating system : Windows XP/7.
- Coding Language : JAVA
- IDE : Eclipse
- Database : MYSQL

V. CONCLUSIONS

In this paper, we have studied the novel paper problem, cross-site cold-start product recommendation, i.e., recommending products from e-commerce websites to micro-blogging users without historical purchase records. Our main idea is the fact that on the e-commerce websites, users and merchandise might be represented in the same latent feature space through feature learning together with the recurrent neural networks. Using some linked users across both e-commerce websites and social network sites as being a bridge, we can learn feature mapping functions utilizing a modified gradient boosting trees method, which maps user's attributes obtained from social networks onto feature representations learned from e-commerce websites. The mapped user features could be effectively incorporated into a feature-based matrix factorization approach for cold-start product recommendation. We've got constructed a big dataset from WEIBO and JINGDONG. The results reveal that our proposed framework is actually effective in addressing the cross-site cold-start product recommendation problem. We feel that the study could have profound affect both research and industry communities.

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