

A Review on Connecting Social Media to E-commerce: Cold-Start Product Recommendation using Micro blogging Information

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Abstract— In recent years, the bounds between e-commerce and social networking have turn out to be increasingly blurred. It is possible to access many E-commerce websites by using users social network accounts like facebook, twitter etc. Users of social networks can able to post their newly purchased products in the micro blogs, and can give links to the E-commerce web pages from where they are purchased. In this paper we have a tendency to propose a unique answer for cross-site cold-start product recommendation that aims to advocate product from ecommerce websites to users at social networking sites in “coldstart” things, a haul that has seldom been explored before. A serious challenge is the way to leverage data extracted from social networking sites for cross-site cold-start product recommendation. This paper proposes, by using neural networks extract user features or user embeddings and product feature or product embedding’s from the data collected from Ecommerce websites. Then by using gradient boosting tree method on the social networking sites, collect user features and combine this with the user embeddings. Then by using matrix factorization method use these user embedding’s for the cold start product recommendation.

Keywords:- e-commerce, product recommender, product demographic, microblogs, 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[1]. Product recommendation is a key area to focus for increased sales for any e-commerce website. For example, Netflix has re-leased an interesting fact that about 75% of its subscribers watch are from recommendations. There are many algorithms which focus on connecting the social media to e-commerce but none are focused on product recommendation by leveraging the social media information like demographic, micro-blogs, location etc[2].

In this paper, we have an interesting problem called “cold-start problem”. We are resolving it by recommending products from e-commerce websites to users at social networking sites who do not have historical purchase records, i.e in “cold-start” environment”. We called this recommendation as “cross site cold-start product recommendation”.

II LITERATURE SURVEY

Opportunity Models for E-commerce Recommendation: Right Product, Right Time Author: Jian Wang, Yi Zhang

This paper studies the new problem: how to recommend the right product at the right time? We adapt the proportional hazards modelling approach in survival analysis to the recommendation research field and propose a new opportunity model to explicitly incorporate time in an e-commerce recommender system. The new model estimates the joint probability of a user making a follow-up purchase of a particular product at a particular time. This joint purchase probability can be leveraged by recommender systems in various scenarios, including the zero-query pull-based recommendation scenario (e.g. recommendation on an e-commerce web site) and a proactive push-based promotion scenario (e.g. email or text message based marketing). We evaluate the opportunity modelling approach with multiple metrics. Experimental results on a data collected by a real-world ecommerce website (shop.com) show that it can predict a user’s follow-up purchase behaviour at a time with descent accuracy. In addition, the opportunity model significantly improves the conversion rate in pull-based systems and the user satisfaction/utility in push-based systems.

2. Retail Sales Prediction and Item Recommendations Using Customer Demographics at Store Level Author: Michael

This paper outlines a retail sales prediction and product recommendation system that was implemented for a chain of retail stores. The relative importance of consumer demographic characteristics for accurately modelling the sales of each customer type are derived and implemented in the model. Data consisted of daily sales information for 600 products at the store level, broken out over a set of non-overlapping customer types. A recommender system was built based on a fast-online thin Singular Value Decomposition. It is shown that modelling data at a finer level of detail by clustering across customer types and demographics yields improved performance compared to a single aggregate model built for the entire dataset. Details of the system implementation are described and practical issues that arise in such real-world applications are discussed. Preliminary results from test stores over a one year period indicate that the system resulted in significantly increased sales and improved efficiencies. A brief overview of how the primary methods discussed here were extended to a much larger data set is given to confirm and illustrate the scalability of this approach.

3. G. Linden, B. Smith, and J. York, "Amazon.com recommendations Item-to-item collaborative filtering," *IEEE Internet Computing*, vol. 7, no. 1, Jan. 2003

Recommendation algorithms are best known for their use on e-commerce Web sites,¹ 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. The click-through and conversion rates — two important measures of Web-based and email advertising effectiveness — vastly exceed those of untargeted content such as banner advertisements and top-seller lists.

4. We Know What You Want to Buy: A Demographic-based System for Product Recommendation On Microblogs Author: Wayne Xin Zhao1, YanweiGuo

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 micro blogs 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 micro blogs and online reviews. METIS distinguishes itself from traditional product recommender systems in the following aspects: 1) METIS was developed based on a micro blogging 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 micro blogs and products' demographics learned from both online product reviews and micro blogs are fed into learning to rank algorithms for product recommendation. We have evaluated our system in a large dataset crawled from Sina Weibo. The experimental results have verified the feasibility and effectiveness of our system. We have also made a demo version of our system publicly available and have implemented a live system which allows registered users to receive recommendations in real time

III PROPOSED SYSTEM

E-commerce websites such as e-Bay has many of the traits of social networks, including real-time updates and interaction between buyers and sellers by using their micro blogs. Some e-commerce websites also support the mechanism of social login, which allows users to login with their existing login information from social networking. There is no such system that has adopted the use of micro-blogging and other demographic information for cold start situation where a customer to e-commerce site is offered suggestion of the products. Here we are focused on the details of the micro-blogging information, demographic information, location information, etc for the product recommendation. In this paper, we face the problem of recommending products to users who do not have any historical purchase records, i.e., in "cold-start" situations. We called the solution to this problem as "cross site cold-start product recommendation".

We propose to use the coupled users across social networking sites and e-commerce websites (users of the social networking accounts and have done purchases on e-commerce websites) as a bridge to map users' social networking features to latent features for product recommendation. In specific, we have a tendency to propose learning each users' and products' feature representations (called user embeddings and product embeddings, respectively) from the information collected from the e-commerce websites by using neural networks then apply a modified gradient boosting trees method to transform users' social networking features into user embeddings. Then by applying a feature based matrix factoring approach which might utilize the learnt user embeddings for cold-start product recommendation.

We propose to use the coupled users across social networking sites and e-commerce websites (users United Nations agency have social networking accounts and have created purchases on e-commerce websites) as a bridge to map users' social networking options to latent options for product recommendation. In specific, we have a tendency to propose learning each users' and products' feature representations (called user embeddings and product embeddings, respectively) from knowledge collected from e-commerce websites exploitation continual neural networks then apply a changed gradient boosting trees methodology to rework users' social networking options into user embeddings. We have a tendency to then develop a feature based matrix factoring approach which might leverage the learnt user embeddings for cold-start product recommendation. It target text attribute, network attribute and temporal attribute

IV CONCLUSION

In this paper, we've got studied a unique hassle, cross site cold-start product advice, i.e., recommending products from e-commerce websites to micro blogging customers with out historical buy facts. Our essential idea is that at the e-trade websites, users and merchandise may be represented inside the identical latent characteristic area via characteristic getting to know with the recurrent neural networks. Using a set of connected users throughout both e-commerce websites and social networking websites as a bridge, we can study characteristic mapping capabilities using a modified gradient boosting bushes technique, which maps customers' attributes extracted from social networking websites onto characteristic representations discovered from e-commerce web sites. The mapped consumer functions can be effectively integrated into a chilly-start product recommendation. The effects display that our proposed framework is certainly effective in addressing the go-web site cold-start product recommendation trouble. We agree with that our observe can have profound impact on each research and industry groups.

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