Recommendation of cold start product by socializing e-commerce

Swaranjali Kharat[1], Chinmay Khedkar[2], Shamali Mane[3], Soniya Raut[4]

Students, Computer Dept., JSPM NTC, RSSOER, Pune, India

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Abstract - *Now a days online shopping has achieved a tremendous popularity within very less amount of time. Recently few ecommerce websites has been developed their functionalities to a extent such that they recommend the product for their users referring to the connectivity of the users to the social media and provide direct login from such social media (such as facebook, Google+ ,etc). 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.*

***Key Words*:**
LDA(Latent Dirichlet Allocation),
CBOW(Continuous Bag-Of-Words model),
SGD(Stochastic Gradient Descent),
para2vec(Paragraph Vector),
MART(Multiple Additive Regression Tree),
PCC(Pearson Correlation Coefficient),
ES(Embedding Similarities),
MFUA(MF with user attributes),
FMUI(FM without User Interactions),
FM(Factorization Machines)

1.INTRODUCTION

Using computer networks, such as the Internet or online social networks , facilitation of trading in products or services is nothing but e-Commerce. E-commerce typically uses the WWW for at least one part of the transaction's cycle and other technologies such as e-mail. This reacts that the e-commerce has huge impact on the economy and society from the other side. In this project, we study 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. We called this problem

cross-site cold-start product recommendation. Constructing solutions within certain e-commerce websites and mainly utilise users historical transaction records.

1.1 Goals and Objectives

Our goal is recommending products from e-commerce websites to Micro blogging users without historical purchase records. Our main idea is that 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. Our objective is Using 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 cold-start product recommendation.

1.2 Software requirement

- Angular JS:-

With the use of AngularJS we can extend HTML vocabulary. Where the content is readable, and quick to develop.

- Java:-

Java is a set of computer software and speci_cations developed by Sun Microsystems, which was later acquired by the Oracle Corporation,that provides a system for developing application software and deploying it in a cross-platform computing environment. Java is used in a wide variety of platforms. While they are less common than standalone Java applications, Java applets run in

secure, sandboxed environments to provide many features of native applications and can be embedded in HTML pages.

- Jsp:-

JavaServer Pages (JSP) is a technology that helps software developers manage to create web pages based various document types. Released in 1999 by Sun Microsystems, JSP16 uses the Java programming language for deploying and run JavaServer Pages.

- Bootstrap:-

Bootstrap is a free and open-source front-end web framework for designing websites and web applications. It contains HTML- and CSS-based design templates for typography, forms, buttons, navigation and optional JavaScript extensions readymade on their site in order to make the and quick and fancy look for the website to be made by the user.

2. LITERATURE SURVEY

[1] Connecting Social Media to E-Commerce:Cold-Start Product Recom-mendation using Microblogging Information Wayne Xin Zhao Member, IEEE, Sui Li, Yulan He, Edward Y. Chang,Ji-Rong Wen Senior Mem- ber, IEEE and Xiaoming Li Senior Member, IEEE
Description: The collaborative filtering recommendation is one of the methods to solve the information overloading problem in E-Commerce.
Year: 2016

[2] Public electronic payments: A case study of the electronic cash sys-tem in Ecuador Luis Tern; Celine Horst; B.Fausto Valencia;Priscila Rodriguez 2016 Third International Conference on eDemocracy eGov-ernment (ICEDEG)
Description: Electronic payment methods, are mainly used in various sector for eCommerce transactions for buying and selling goods or services offered through the Internet.
Year: 2016

[3] Getting a purchase on christmas [IT Ecommerce] Chris Edwards Engi-neering Technology
Description: We tend to trust on postal shops rather than online shopping but we have used a attractive gui for the user to stay on the website more often
Year: 2013, Volume: 4, Issue: 21

[4] A fuzzy approach for multi criteria decision making in web recommen-dation system for e-commerce L. Hu, J. Cao, G. Xu, L. Cao, Z. Gu in WWW.
Description: Recommendation systems are used in e-commerce for recommending products to the users. From this paper we took the fuzzy logic and it's disadvantages are overcome in our paper with the use of matrix factorization.
Year:2013

[5] A recommendation scheme utilizing Collaborative Filtering Telang, R., Boatwright, P., Mukhopadhyay, Internet Technology and Secured Transactions (ICITST), 2013 8th International Conference 13
Description: Recommendation has many types which are currently in use. We used collaborative filtering approach from this paper.
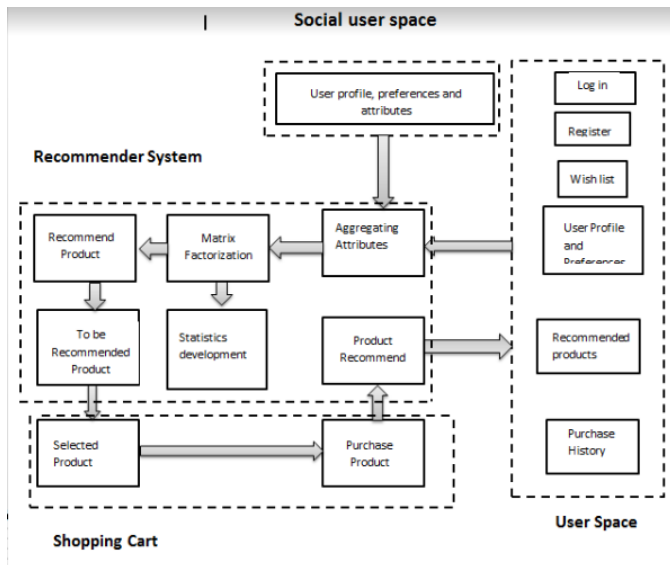Year:2013

3. SYSTEM ARCHITECTURE

Fig -1: System Architecture

In the above fig-1, System Architecture is shown. The system architecture user space is allocated to user with the availability of full access to his/her account including the purchases made. For aggregating the attributed/information of the user is fetched from the social user space of user's social network. The recommender system inturn process the algorithm in order to predict the products to be recommended.
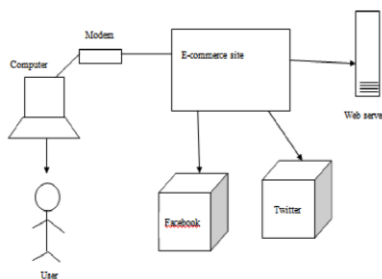
4. Deployment

Figure A.8: Deployment Diagram

Fig -2: Deployment Diagram

In the above fig-2, the deployment diagram is shown. Deployment Diagram represents the physical objects participated in the system. The user can view, add, buy a product and get recommendation and admin can check the user details. The deployment diagram shows the above mentioned processes with the social network connectivity implanted in the model for a cold start problem elimination.

5. Mathematical Model

Input:

[1] I={U,P, ul, u', u, a, R, s, f}
[2] Let U:set of all the users and P:set of products
[3] Let {ul} be the set of users who are linked to their microblogging accounts.
[4] Let u be the set of users who have purchasing history and
[5] u € U
[6] Let {a} is the microblogging feature.
[7] Let u' be the microblogging user who is new to ecommerce website.
[8] Let v b the transformed feature representation (done by factorization with {a}u').
[9] Let R be the functional relations
[10]   Let s b condition for success
[11]   Let f be the condition for failure

Output:

[1] O={v} ,Where v is transformed attribute obtained by using deep learning from all {U}.

Functions and relations:

[1] R: P×U :Purchase record matrix
[2] In a cold start senario, u'∉ U but we have u € U.
[3] So we have to consider microblogging attributes, a of the new user u'.
[4] Now {v}u' = U   transformed attribute is obtained by using deep learning from all {U}.

Success Conditions: {v}u' = U . If transformed attribute of the new user is obtained.

Failure Conditions: {v}u' ≠ U. If transformed attribute of the new user is obtained.

6. CONCLUSIONS

In this paper, we have studied a novel problem, *cross-site cold-start product recommendation, i.e., recommending* products from e-commerce websites to Microblogging users without any historical records. For this, we have used the social media connectivity for a new user for knowing his/her profile information.

7. FUTURE OF E-COMMERCE

[1] According to business world estimate near about Sixty thousand new jobs will be created for the internet world every two years.

[2] E-Commerce transactions are expected to cross the Rs. 3500 bn milestone in 2020-21, a jump of around 350 percent from the 2008-09 figure of Rs. 1000 crore.

[3] eBay said that consumers were trading goods worth almost three crore rupees everyday, across the globe.

8. REFERENCES

[1] Connecting Social Media to E-Commerce:Cold-Start Product Recommendation using Microblogging Information Wayne Xin Zhao *Member, IEEE*, Sui Li, Yulan He, Edward Y. Chang,Ji-Rong Wen *Senior Member, IEEE* and Xiaoming Li *Senior Member, IEEE2016*

[2] L. Ju, J. Cao,. Gao, Z. Gu, and C. Zhu, "Personalized recommendation via cross-domain triadic factorization," in *WWW Companion, 2013.*

[3] L. Zhao, S. J. Pan, E. W. Xiang, E. Zhong, Z. Lu, and Q. Yang,"Active transfer learning for cross-system recommendation,"in *AAAI, 2013.*.\

[4] B. Bollerit, M. Kroll, and M. Strohmaier, "Towards linking buyers and sellers: Detecting commercial intent on twitter," in *WWW Companion, 2013*

9. BIOGRAPHIES

Swaranjali J. Kharat
BE COMPUTER ENGINNEERING
JSPM NTC RSSOER
PUNE
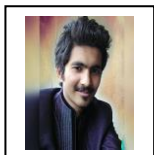
Chinmay R. khedkar
BE COMPUTER ENGINNEERING
JSPM NTC RSSOER
PUNE

Shamali D. Mane
BE COMPUTER ENGINNEERING
JSPM NTC RSSOER
PUNE

Soniya S. Raut
BE COMPUTER ENGINNEERING
JSPM NTC RSSOER
PUNE