



## MINING USERS TRUST FROM E COMMERCE REVIEWS BASED ON SENTIMENT SIMILARITY ANALYSIS

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### ABSTRACT

Consumers' reviews in E-commerce systems are usually treated as the important resources that reflect user's experience, feelings, and willingness to purchase items. All this information may involve consumers' views on things that can express interest, sentiments, and opinions. Many kinds of research have shown that people are more likely to trust each other with the same attitude toward similar things. In this paper, we consider seeking and accepting sentiments and suggestions in E-commerce systems somewhat implies a form of trust between consumers during shopping. Following this view of point, an E-commerce system reviews mining oriented sentiment similarity analysis approach is put forward to exploring users' similarity and their trust. We divide the trust into two categories, namely direct trust, and propagation of trust, which represents a trust relationship between two individuals. The direct trust degree is obtained from sentiment similarity, and we present an entity-sentiment word pair mining method for similarity feature extraction. The propagation of trust is calculated according to the transitivity feature. Using the proposed trust representation model, we use the shortest path to describe the tightness of trust and put forward an improved shortest path algorithm to figure out the propagation trust relationship between users. A large-scale E-commerce website reviews dataset is collected to examine the accuracy of the algorithms and feasibility of the models. The experimental results indicate that the sentiment similarity analysis can be an efficient method to find trust between users in E-commerce systems.

### INTRODUCTION

Reviews from consumers are very important information in E-commerce systems. Many online shops have developed reviews system for users to post their reviews. With the rapid development of social networking media, more and more people are willing to share their feelings, opinions and suggestions on their bought items with their friends or even strangers in social network applications or E-

commerce systems. These reviews can be very useful for people's decision making in many different scenarios such as users' preference mining and personalized recommendation. At present, more and more review mining based applications are being applied to make our decision process easier than before. These applications have greatly changed people's behavior patterns, especially in E-commerce activities. For



example, WHEN people want to buy Product, book a hotel or restaurant, they usually not only ask for advice from their friends but also refer to reviews available online. To adapt to this change, many famous E-commerce companies, such as Amazon, eBay and Taobao (China), have built up well-function consumer review systems.

Online experience from various people can help one make decisions. In this case, people and their experience are required to be trusted by others. It makes sense that we usually ask for advice from our friends or family members before we make a decision. But the question is, why individuals are inclined to rely on strangers in cyber space to make decision? Scholars find a primary reason for that is their lack of trust in companies that they only experience through the web medium. The virtual nature of the web medium challenges traditional understanding of customer trust. In E-commerce scenario, customers have no chance to have a face-to-face interaction with a sales man or a direct physical experience with the store and the products they want to buy. On one hand, their experience is mediated through the web which is a two-dimensional graphical display. They usually feel somewhat lost and need someone to give them advices. On the other hand, reviews from consumers who purchase an item have direct physical experiences with it, are seem to be more reliable than vendor's promotions or advertising words.

However, E-commerce websites usually accumulate large scale text based reviews which records historical commentary about one subject or item. Usually, consumers are unable to distinguish which reviews can be trusted under so large information. Different

consumers can hold different aspects and standpoints in viewing things. And their attitudes, interests, preferences, etc. will vary greatly towards the products or services. Some users give a positive rating because they like certain attributes of the product, while others give a negative rating because they don't like these attributes. Therefore, it is impossible for a consumer to judge whose reviews are suitable and which users can be trusted. The consumers urgently need to be established a trust between other users, which give their view she can trusts, provide him with an opinion reference, and shield the untrusted comments to prevent misleading to the user when he wants to purchase an item.

Many scholars have spent much effort on the phenomenon of trust relationship between strangers in E-commerce environment and found an interesting result: people are more willing to trust the individuals who are similar with them in as many respects as possible. The similarity factors include the brought items, the sentiment style of reviews, the words used, etc. There are many studies trying to explore the relationship between people's mutual trust and their similarity quantitatively, and find that there is a strong correlation between both trust and interest similarity. Although there is a certain relationship between the trust of users and the similarity of users, this relationship is not an obvious linear relationship between trust and similarity, and it also includes many other influential factors. How to correctly find the relationship between trust and similarity still faces great challenges.

Due to its human-related properties, trust is difficult to be uniformly defined or even precisely described. The vast majority of



existing studies focused on trust construction and maintenance between customers and companies over time and after repeated experiences. While limited effort is spent on trust between consumers and potential consumers in E-commerce systems. Obviously, in the field of E-commerce reviews, people are more concerned about the credibility of reviews and the trust of user who post the reviews. In our work, we aim to investigate trust between users in E-commerce systems quantitatively by exploring their reviews and evaluations regarding to various

### LITERATURAL SURVEY

**TITLE: TruCom: Exploiting domain-specific trust networks for multicategory item recommendation.**

**Author:** H. Liu, F. Xia, Z. Chen, N. Y. Asabere, J. Ma, and R. Huang.

Recommender systems (RSs) have become important tools for solving the problem of information overload. With the advent and popularity of online social networks, some studies on network-based recommendation have emerged, raising the concern of many researchers. Trust is one kind of important information available in social networks and is often used for performance improvement in social-network-based RSs. However, most trust-aware RSs ignore the fact that people trust different subsets of friends pertaining to different domains, such as music and movies, because people behave differently in diverse domains according to different interests. This paper proposes a novel recommendation method called TruCom. In a multicategory item recommendation domain, TruCom first generates a domain-specific trust network

pertaining to each domain and then builds a unified objective function for improving recommendation accuracy by incorporating the hybrid information of direct and indirect trust into a matrix factorization recommendation model. Through relevant benchmark experiments on two real-world data sets, we show that TruCom achieves better performance than other existing recommendation methods, which demonstrates the effectiveness and reliability of TruCom.

**TITLE: Effects of sentiment on recommendations in social network.**

**Author:** P.-Y. Hsu, H.-T. Lei, S.-H. Huang, T. H. Liao, Y.-C. Lo, and C.-C. Lo.

This study adopted a sentiment word database to extract sentiment-related data from microblog posts. These data were then used to investigate the effect of different types of sentiment-related words on product recommendations. The results indicate that posts containing strong sentiments received more clicks than posts containing neutral sentiments. Posts containing more than one positive sentiment word generate more effective recommendations than posts containing only one positive sentiment word. This study also demonstrated that posts with a negative polarity classification received more clicks than those with a positive polarity classification. Additionally, the microblog posts containing implicit sentiment words received more clicks than those containing explicit sentiment words. The findings presented here could assist product or service marketers who use Plurk or similar microblogging platforms better focus their limited financial resources on potential online customers to achieve maximum sale revenue.



**Title: The joint beta distribution with refund rate in online C2C trust building: A theoretical study on Taobao.**

**Author:** C. Qin, W. Siyi, and A. Lin.

Lack of trust is one of the fundamental reasons for losing customers from “faceless” e-commerce websites in the consumer-to-consumer market. In order to combat problems with dishonest market participants, a reputation system based on the trustworthiness of sellers has been widely established by the service provider. Traditionally this trust model is mainly based on feedback mechanism while neglecting the other important factors, such as, refund rate, which may lead to transaction risks in the new transaction. This paper proposes a global reputation rating method by using joint beta probability density functions to combine positive feedback rating and refund rate. The new trust model has the advantage of tractability and scalability as well as its theoretical sound basis on statistics.

## SYSTEM ANALYSIS

### Existing System:

All this information may involve consumers' views on things that can express interest, sentiments, and opinions. Many kinds of research have shown that people are more likely to trust each other with the same attitude toward similar things. In this paper, we consider seeking and accepting sentiments and suggestions in E-commerce systems somewhat implies a form of trust between consumers during shopping. Following this view of point, an E-commerce system reviews mining oriented sentiment similarity analysis approach is put forward to exploring users' similarity and their trust. We divide the trust

into two categories, namely direct trust, and propagation of trust, which represents a trust relationship between two individuals. The direct trust degree is obtained from sentiment similarity

### Proposed System:

We present an entity-sentiment word pair mining method for similarity feature extraction. The propagation of trust is calculated according to the transitivity feature. Using the proposed trust representation model, we use the shortest path to describe the tightness of trust and put forward an improved shortest path algorithm to figure out the propagation trust relationship between users. A large-scale E-commerce website reviews dataset is collected to examine the accuracy of the algorithms and feasibility of the models. The experimental results indicate that the sentiment similarity analysis can be an efficient method to find trust between users in E-commerce systems.

## IMPLEMENTATION MODULES

1. User
2. E-seller

### Module Description

#### User:

Here the user one of the module and the user should register with the application after the registration the user must be authorized by the e-seller admin. Then only the user can able login with the application.





After the user successful login, the user can able to perform the following operations such as

- My Profile ,Search Friends
- View Friend Requests
- View My Friends
- Delete My Friends
- Search Products And Recommend
- View Post Recommend
- Friends Products Consumes

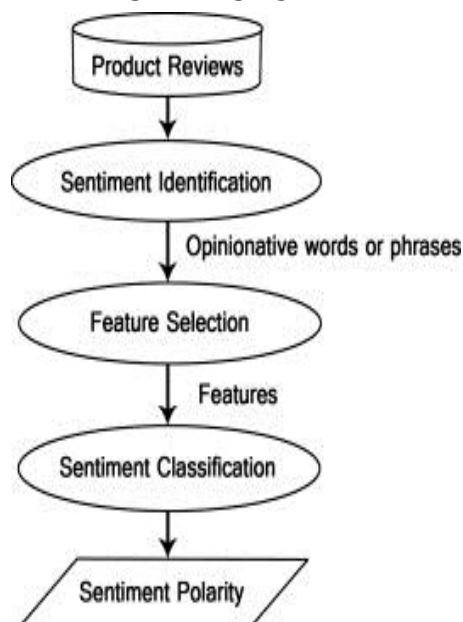
### E-seller:

Here the e-seller is the main module and e-seller can login directly with the application and after the successful login the e-seller can able perform the some operations such as

- View And Authorized Users
- All Friend Request/Response
- Add and View Categories
- Add Products
- View All Products With Ratings
- View All Products Reviews
- View All Products Sentiment Similarly By Reviews
- View All Purchased Product Details
- View User Query Keyword
- View All Products Consumes By Users
- View All Recommended Products
- View Product Rank Results

## 1. SYSTEM DESIGN

### SYSTEM ARCHITECTURE



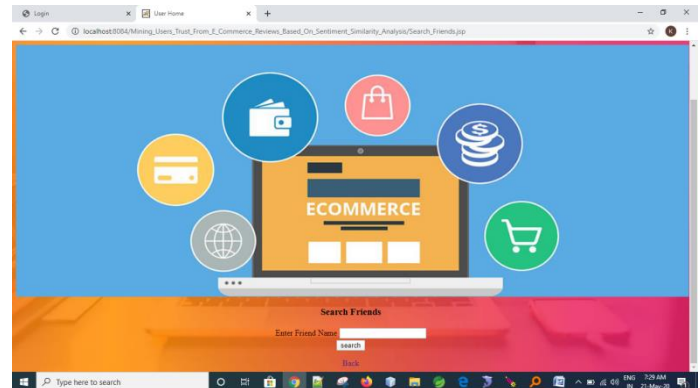
### Results



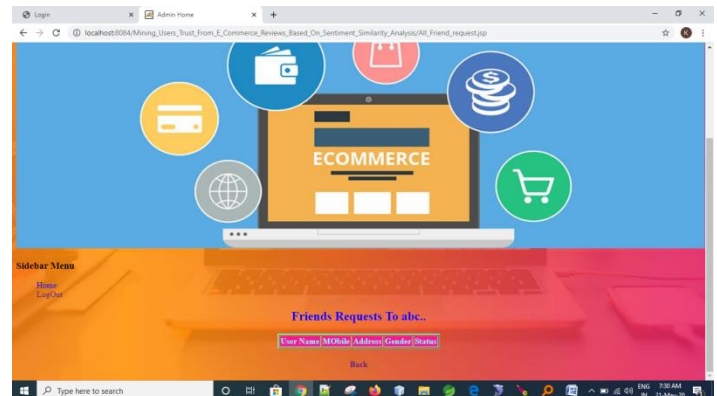
### USER REGISTRATION



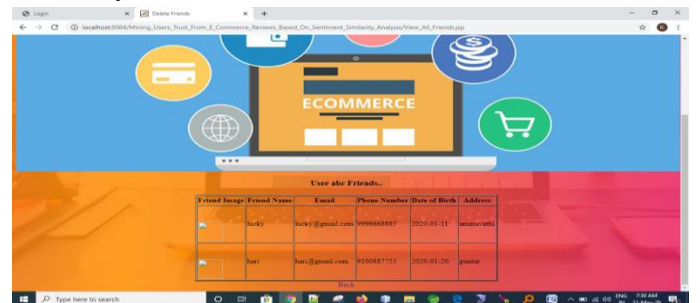
## Search friends



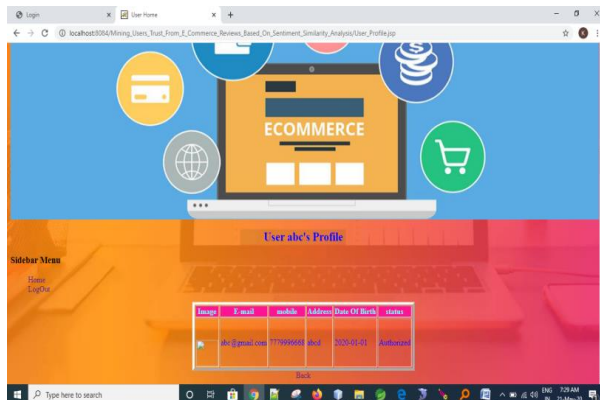
## View friend request page



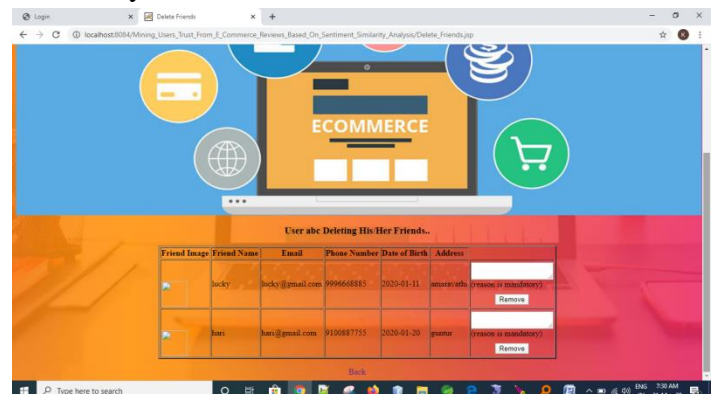
## View my friends



## User's profile

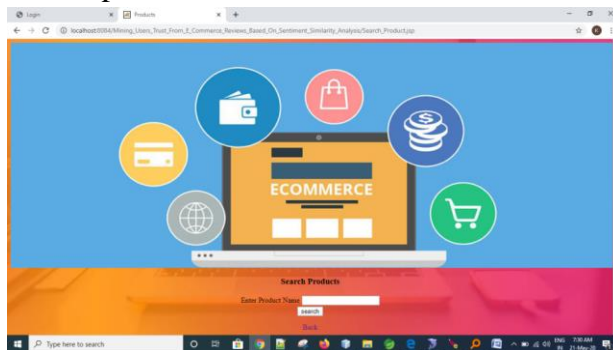


## Delete my friends

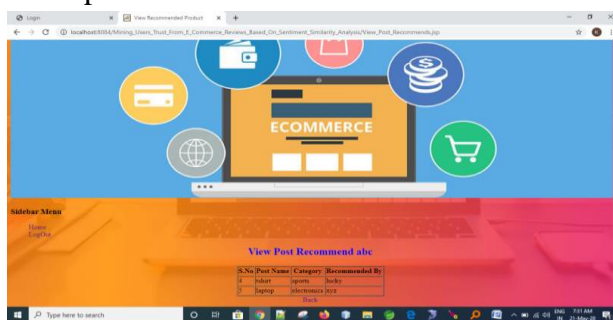




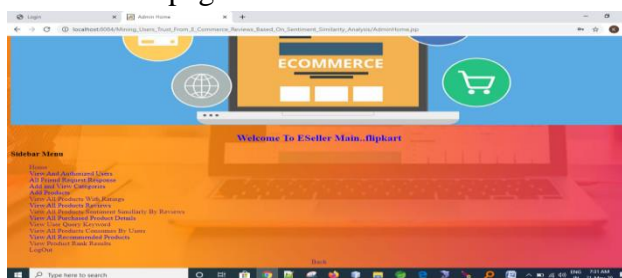
### Search product and recommends



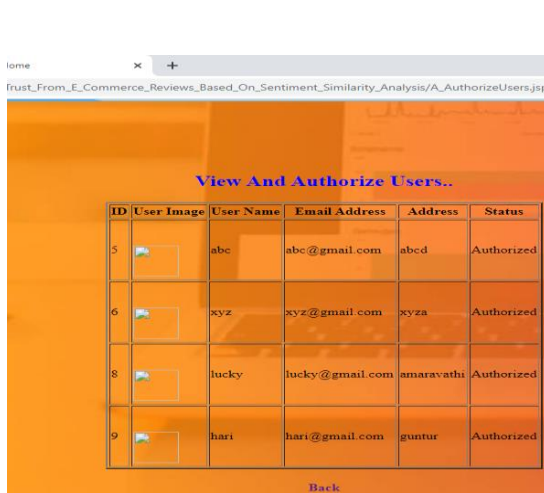
### View post recommends



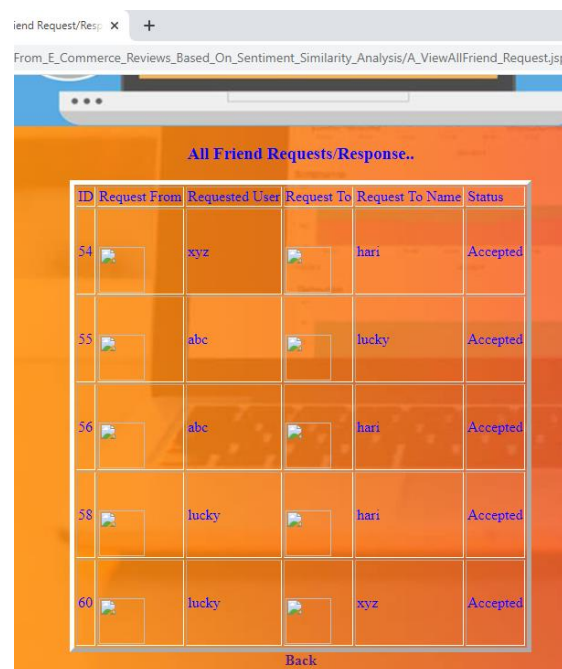
### Seller home page



### View users and authorize



### View friends request and response



### Add category



### Add products





## View all products reviews

S No	Product Image	Product Name	Reviewed User	Review Details	Ecommerce Company
2		tshirt	hari	good	sports
3		fridge	abc	good	furniture

## CONCLUSION

In our work, we address the problem of mining users trust in E-commerce system. By defining two kinds of trust relationship,

namely, direct trust and propagation trust, we transfer the point of exploring trust between users into calculation of sentiment similarity of their reviews. With the help of entity-sentiment word pairs mining, sentiment similarity of reviews can be calculated and direct trust relationships can be obtained through sentiment similarity analysis, which contains of sentiments and ratings aspect. These two aspects can be used jointly to analyse the sentiment direct trust relationship. We establish a weighed trust graph model for propagation trust computing. Propagation trust is the use of the propagation characteristics of trust. It is an indirect trust between two users without direct trust and is obtained through intermediate users who have direct trust between these two users. The propagation trust calculation approaches based on the improved shortest path algorithm, and the time complexity is  $O(V^2)$ , where  $V$  is the number of node in the graph. Ways to improve the computational complexity of the algorithm is a new problem that needs further study because the relatively large number of users in modern e-commerce system.

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