

Securing Online Reputation Systems through Temporal Analysis

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ABSTRACT

Reputation systems provide mechanisms to produce a metric encapsulating reputation for a given domain for each identity within the system. These systems seek to generate an accurate assessment in the face of various factors including but not limited to unprecedented community size and potentially adversarial environments. We focus on attacks and defense mechanisms in reputation systems. We present an analysis framework that allows for general decomposition of existing reputation systems.

The assessment of credibility and reputation of contractors in online shopping portal or e-commerce is the key issue in providing reliable environment for customer-to-customer e-commerce. Confident reputation rating system is an important factor in managing risk and building customer satisfaction.

Unfortunately, most online shopping portal sites employ a very simple reputation rating scheme that utilizes user feedbacks and comments issued after committed auctions. Such schemes are easy to deceive and do not provide satisfactory protection against several types of fraud. So we propose an anomaly detection technique for finding unfair recommendation in online shopping portal.

INTRODUCTION

Online purchasing is not entirely a new concept to grasp. It has been lingering in the background ever since the Internet was commercially available to the public. Many companies have utilized the Internet as a channel for fashion retail marketing (Murphy, 1998), such retailers as Gap clothing.

Introduction to Online Shopping:

With popular trends and demands the concept of the Internet as the way forward to increase profit margins, companies new and old are creating websites here and there.

The significance for retailers to having a web site is that a web site is informational and transactional in nature (Murphy, 1998). As the web site can be used for advertising and direct marketing; sales; customer support and public relations.

Significantly according to a study by McKinsey & Company and Salomon Smith Barney, E-tailers who sell to their customers through catalogues; stores, and online significantly emerge victorious amid the e-tail shake out (Pastore, 2000).

With seasonal events and holidays, the Internet has become a tool for a quick and stress free method of shopping. Allowing retailers to cash in the profit from another useful shopping channel.

Jupiter Research expects 2003's online holiday sales to be led by new shoppers, resulting in a 21 percent increase over 2002 figures (Greenspan, 2003). The growth in holiday sales is driven by factors such as, online bargains; time saving; avoiding holiday crowds and much more.

EXISTING SYSTEM:

The existing systems of securing online reputation system falls under four major categories. They are as follows:

- In the first category, the defense approaches limit the maximum number of ratings each user could provide within certain time

duration. Such type of approaches actually restricts the rating power of each user ID. This can prevent the attackers from inserting a large amount of dishonest ratings through a few user IDs within a short time.

- In the second category, the defense schemes aim to increase the cost of launching an attack.
- In the third category, the defense approaches investigate rating statistics. They consider ratings as random variables and assume dishonest ratings have statistical distributions different from normal ratings.
- The defense approaches in the fourth category investigate users' rating behaviors. Assuming that users with bad rating history tend to provide dishonest ratings, such approaches determine the weight of a rating based on the reputation of the user who provides this rating. Such reputation is also referred to as trust or reliability.

DISADVANTAGES OF EXISTING SYSTEM:

- Time domain
- Majority rule

PROPOSED SYSTEM:

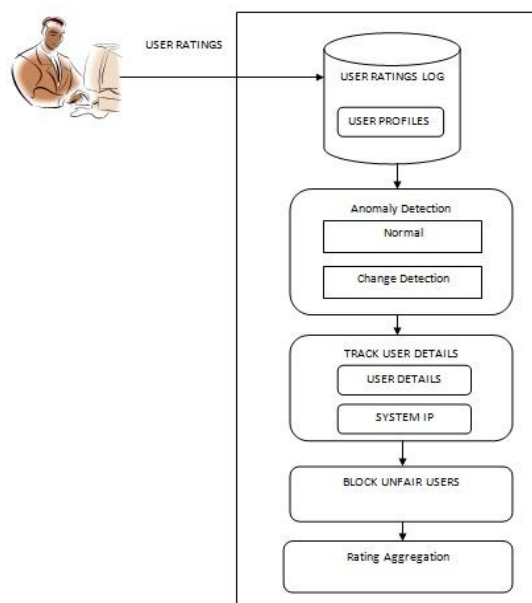
In this work, we propose a reputation defense scheme, TATA. The objective of the proposed scheme is to (1) detect the malicious users who provide dishonest ratings; (2) recover reputation score of the target item, that receives dishonest ratings; and (3) avoid interference to normal items' reputation scores.

We propose a change detector in TATA as the anomaly detector, which takes the rating sequences as inputs and detects changes occurring in the rating sequences. The proposed change detector will detect not only sudden rapid changes but also small changes accumulated over time. In this way, even if malicious users insert dishonest ratings with small shifts to gradually mislead items' reputation scores, such type of changes will still be accumulated and finally be detected by the proposed change detector.

ADVANTAGES OF PROPOSED SYSTEM:

- Identifies the false users
- Lists the false users, so based on it, the admin can block the user for further false ratings
- Recover from false reputations

SYSTEM ARCHITECTURE:



IMPLEMENTATION

MODULES:

1. Online Shopping Module
2. User Rating Module
3. Data Collection Module
4. Change Detection
5. Identify and Block unfair users

MODULES DESCRIPTION:

Online shopping Modules

In the module, we developed a website for online shopping. The user can purchase products and also has the facility to provide ratings and their suggestions as feedback. In this module, the admin can add product details (product name, price, validity etc..) based on the category likes mobiles, computers, laptops etc.. and maintain the product details. The user enter their credit card details, the credit card is validated. If the card

details is valid, the user can purchase their items. The user can select purchasing products displayed in the home page or search the product using keyword or based on category. Then user can purchase the product using credit/debit card. To purchase, the user need to provide the following details like (credit card number, card holder name, date of birth, credit card provider).

If the credit card is valid the user is allowed to purchase the product.

User Rating Module

In this module, the user is allowed to have the facility of providing their feedback in form of ratings regarding the service provider. User ratings are considered as one of the important factor as they play a vital role in the purchase of the product. Wrong/unfair ratings may lead to severe problems in many systems.

So in this module, we collect the user ratings and secure them.

Data Collection Module

In this module, the entire user profiles value and ratings are collected. User profiles values also include their system IP, time, duration and rating values etc.

All the user profiles including ratings values are saved securely.

Change Detection Module

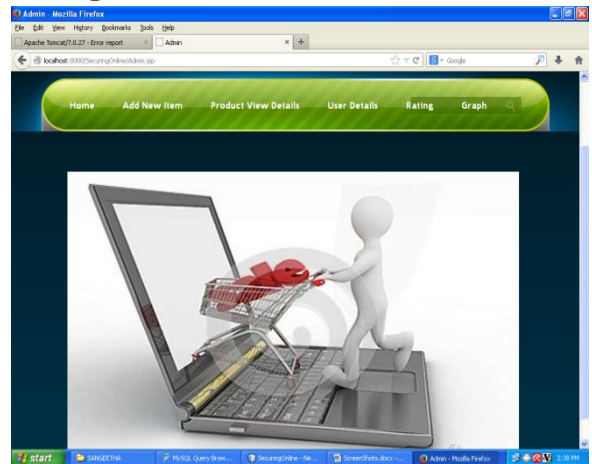
In this module, all the data's collected are used as a dataset. In the Dataset we identify the fraud users by user name by sudden change detection. The graph displays the user fraud percentage across months and measure weight for Test dataset user.

Identify and Block unfair users:

In this module we develop the system such that admin of the portal can have the rights to block the unfair users, such that the users cannot provide unfair recommendations.

SCREEN SHOTS:

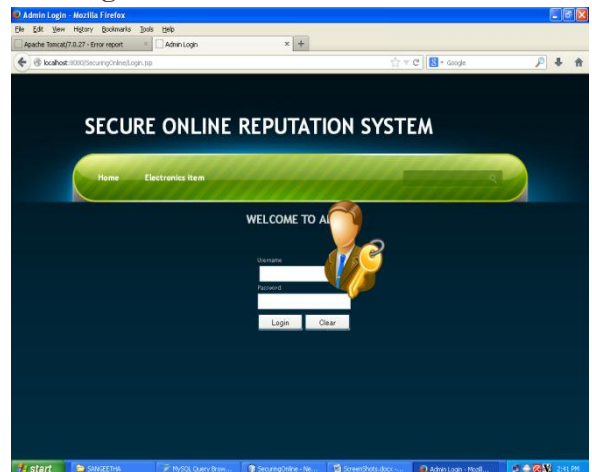
Home Page:



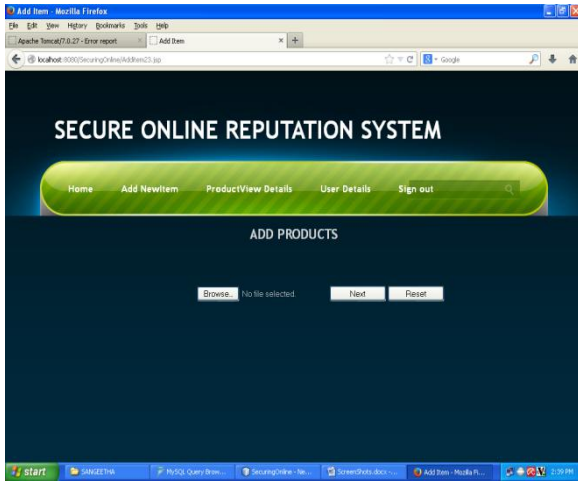
Search by Products:



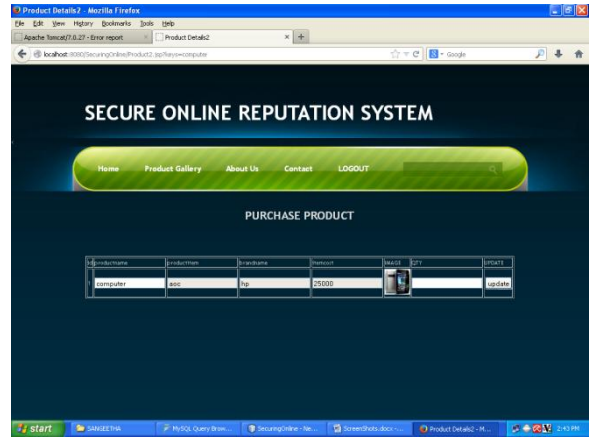
Admin Login:



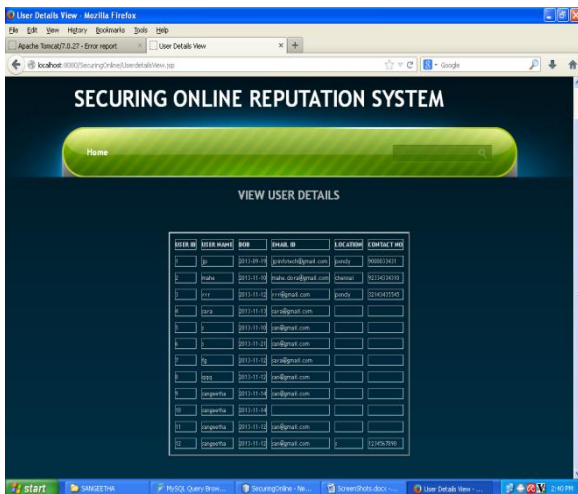
Add Products:



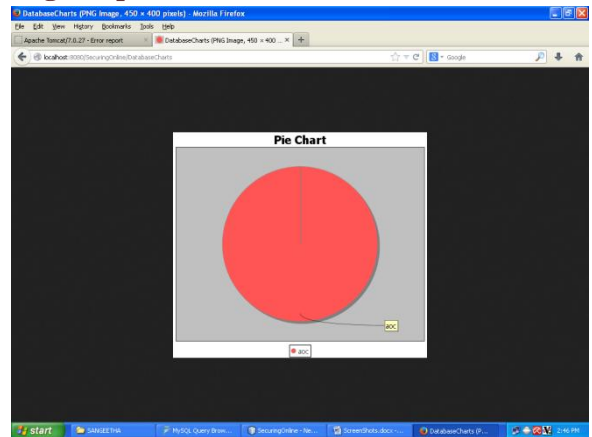
Purchased Products:



User Details:



Rating Graph:



User Login:



CONCLUSION

Many schemes have demonstrated very good performance in protecting reputation systems, there are still limitations that are not fully addressed. In this paper, a comprehensive anomaly detection scheme(TATA) is designed and evaluated for protecting feedback-based Online reputation systems. TATA demonstrates significant ad-vantages in terms of identifying items under attack, detecting malicious users who insert dishonest ratings, and recovering reputation scores. To analyze the time-domain information, a revised-CUSUM detectors developed to detect change intervals. Online reputation systems are increasingly influencing people's online purchasing/downloading decisions. And thus the project has been implemented successfully based on the TATA reputation system.

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