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RESEARCH ARTICLE

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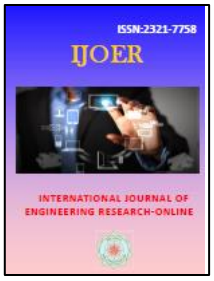
USING DATA MINING DETECTION OF FRAUD IN TRANSACTION

ROHIT MANKAME[1], SAPNA NIKAM[2], AKASH GURAV[3]
[1,2,3]B.E. Comps Students Department of Computer Engineering,
K.C. College of Engineering & Management studies & Research, Kopri,Thane(E), India
[1]rohit.mankame09@gmail.com;[2]sapnanikam11@gmail.com;[3]akashg5188@gmail.com



ABSTRACT
Most transactions today are executed with the use of credit cards related to various operations both online and offline. Therefore, security to these type of transactions has to be provided to a high extent. To achieve this motive the mining model mechanism has been proposed here for analyzing transactions executed by users and thereby identifying an invalid set of transactions. Credit card fraud occurs when user provide their information to the unknown persons or stolen by the unknown persons, that information can be used for unauthorized online purchase and some other situation. A technique is required to detect such fraud events. Many techniques are exist to detect such frauds. But these existing techniques are not efficient to provide better performance to detect such credit card fraud events. In this paper a hybrid technique which uses the properties of PGNN and Cost based model is presented which provides enhanced functionality to detect credit card frauds. The analysis of hybrid technique shows that the proposed technique provides an accurate and efficient way to detect credit card frauds.
Thus aim of the project is to improve as well as can enhance the experience of the user by saving time and the exposure to the new security techniques.
Keywords—PGNN(Parallel Granular Neural Network), CBM(Cost Based Model), HMM(Hidden Markov Model), Credit Card Fraud Detection.

1. INTRODUCTION

Credit-card-fraud may be termed as an unauthenticated use of the system or the criminal activity by the use of the physical card or information of card without informing the holder of card .The credit card is a small plastic card, which has been issued to the user like a system of payment. With fast growth in its number of credit card transactions, all fraudulent activities have been increased. The credit card might be physical or virtual. In some physical-card [1], the cardholder shows his card physically to few merchant for generating payment. To proceed fraudulent transactions for such purchase, an attacker grab the credit card. Secondly purchase, only little crucial information regarding card like as card number, expiration date, secure code and etc. are needed for making payment. Such purchases are generally committed over the Internet or on phone. To commit fraud in such type of purchases, a fraudster requires being aware of card details. Mostly, the genuine cardholder isn't familiar that somebody else has stolen their card information. In actual life, fraudulent transaction have been scattered through genuine transactions and the simple pattern matching Techniques aren't mostly satisfactory to search those frauds exactly. Outlier detection refer as data mining technique generally detected for

fraud detection [2]. Outliers are the data points which are inconsistent with its reminder the dataset or deviate so much from some other observations so as to the arouse suspicion as they were produced through various approaches. Outlier detection may be obtained through techniques like neural network, SOM, HMM etc.

Fraud transaction takes place in such mode, only when the card been stolen. It became hard to search fraud in such transaction. When the card holder does not aware of loss of their card and don't reports to the police or that card issuing company, that person will faces thee economical loses to issuing the authorities. Another approach of the purchasing such as Online, these transactions basically take place on telephone or internet and for making such transaction the user requires some crucial information of that credit card (such as credit card number, validity, CVV number, name of card holder). To attempt fraud transaction to buy goods and services, fraudster must be loaded with all details of the card only after that he/she can make transactions. Mostly, the cardholder might or may not aware that when or where that person can be seen or hide card information. To search such of fraud transaction, they have introduced a Hidden Markov Model which observes the spending profile of that card holder. An HMM observes the spending profile of every card holder and detect any type of discrepancy in such spending patterns.

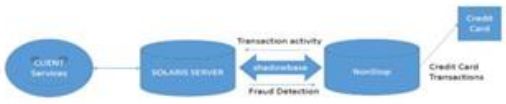


Figure 1.1: Over View of Credit Card Fraud Detection Process

Fraud detection are been searched on the analyzing of any last transactions data which assist to make spending profile of the card holder. Every card holder possess unique pattern having information regarding level amount of the transactions, and information of the items purchased, merchant information, date of the transaction etc. It is the efficient method to counter fraud transaction by internet. When some deviation is observed from the available patterns of that card holder, then it can generate any alarm to that system for stopping the transaction. Rest of the paper organizes as follows: II Literature Review, a brief over view over the techniques used for credit card fraud detection is presented in this section. III Problem Definition, brief description over the problems in credit card fraud detection techniques is presented in this section. IV Proposed Methodology, An overview over the proposed technique is presented in this section. V Experimental Setup, a description over the experimental scenario is presented in this section. VI Result Analysis, a comparison of the results is presented in this section. VII Conclusion.

2. LITERATURE SURVEY

Salvatore J. Stolfo, Wei Fan, Wenke Lee [5] a distributed data mining system for credit card fraud detection is presented. In that system MADAM ID (Mining Audit Data for Automated Model for Intrusion Detection) is used to integrate cost based model with intrusion detection system to detect anomaly in credit card transactions a JAM project based model is used to provide better performance for fraud detection. In that technique cost model integrated with the data mining technique in distributed manner are used. Which provide an enhanced functionality to detect fraud in credit card transactions.

But automated distribution of cost based trained data is not possible thus an automated distribution based technique is required to provide better performance to detect credit card frauds. Mubeena Syeda, Yan-Qing Zbang and Yi Pan [6] a fast and efficient data mining technique for data mining and knowledge discovery of credit card fraud related data is presented.

A parallel fuzzy neural network is used to train the dataset which contains data about credit card frauds in that technique multiple system works simultaneously to provide better performance to detect credit card frauds logs data of the various credit cards transactions are used to detect credit card frauds. But in that technique logs and updated logs are required to provide an enhanced credit card fraud detection mechanism which degrades the performance of the whole technique. Philip K. Chan, Florida Institute of Technology Wei Fan, Andreas L. Prodromidis, and Salvatore J. Stolfo [7] a cost model based technique which uses data mining techniques

in a distributed manner to provide an efficient mechanism to detect credit card frauds. In that technique dataset divided into various subsets and then data mining techniques are applied over these subsets to provide to generate classifiers for these subsets. In that way Meta classifiers are generated which provides an enhanced functionality to detect frauds in credit card transactions.

3. EXISTING SYSTEM

Credit card fraud occurs when user provide their information to the unknown persons or stolen by the unknown persons, that information can be used for unauthorized online purchase and some other situation. A technique is required to detect such fraud events. Many techniques are exist to detect such frauds. But these existing techniques are not efficient to provide better performance to detect such credit card fraud events.

Challenges of existing system:-

- In PGNN a Fuzzy neural network based technique is presented[3]. In that technique a distributed mechanism is presented to provide an efficient mechanism for credit card fraud detection. In that technique log data of different credit card transactions is used, to detect credit card frauds. But in that technique updated logs are required to detect credit card frauds. . In PGNN a dependency on the log data is poses which degrades the performance of the technique.
- In cost based model[4] data mining techniques over the large scale dataset which contains data about various credit card fraud events is presented. In that large dataset is divided into small subsets and then meta- classifiers are generated by the use of data mining technique and a cost model is integrated with this technique to provide an enhanced functionality to provide better performance for credit card fraud detection. cost based model training based on the defined cost is not automated which degrades the performance of the technique, in HMM[5], a person's information always treated as a fraud if it once detected as a fraud which reduces flexibility of the system.
- But there no automated distribution of the data is provided which degrades the performance of the whole technique.

4. PROPOSED SYSTEM

In this paper a hybrid technique which uses the properties of PGNN and Cost based model is presented which provides enhanced functionality to detect credit card frauds. The analysis of hybrid technique shows that the proposed technique provides an accurate and efficient way to detect credit card frauds.

Challenges that we are going to cover:-

- To resolve the above challenges associated with two different techniques, we are implementing the new technique. That is hybrid (combination of both above mentioned tech) technique.
- A new hybrid technique which poses the properties of cost based model and parallel granular neural network to provide an enhanced credit card fraud detection mechanism.
- To evaluate the performance of the proposed technique Precision, Recall and F-measures are used as evaluation parameters. That analysis shows proposed technique provides better precision, Recall, and F-measure.

A new hybrid technique which poses the properties of cost based model and parallel granular neural network to provide an enhanced credit card fraud detection mechanism is presented in this paper. Proposed algorithm In this algorithm, U represents user, C represents card, D represents details.

1. Start
2. User registers himself to the shopping portal SP with credentials CR
3. login into SP
    a. if(first login)
        i. Prompt user to set Security Question.
        ii. Prompt user to set card details D
        iii. Prompt to login again
    b. Else
        i. Check if(IP used >5)
            1. Treat IP as Familiar
            2. Put question sets 1
        ii. Else if(IP used <=5 && IP used >=3)
            1. Treat IP as Friendly
            2. Put question sets 2

iii. Else
1.Treat IP as public
2.Put question sets 3 iv.If(user gives correct answers to all sets)
1. Allow to login and Shopping
v. Else block the user for that IP as PGNN
4. Shopping starts and go for transaction
a. If(Transaction Amount TA>Limit L) Block the transaction as CBM
Else if (Product quantities PQts >LQts) Block the transaction as CBC
Else if (new TA > Average Limit AL) Block the transaction
Else
Proceed to transaction Prompt to enter card details If (true)
Log Transaction Successful
Else
Log transaction as blocked
5. Ends here.

4.1 Credit Card Fraud Detection Using HMM

In this section, it is shown that system of credit card fraud detection based on Hidden Markov Model, which does not require fraud signatures and still it is capable to detect frauds just by bearing in mind a cardholder's spending habit. The particulars of purchased items in single transactions are generally unknown to any Credit card Fraud Detection System running either at the bank that issues credit cards to the cardholders or at the merchant site where goods is going to be purchased. As business processing of credit card fraud detection system runs on a credit card issuing bank site or merchant site. Each arriving transaction is submitted to the fraud detection system for verification purpose. The fraud detection system accept the card details such as credit card number, cvv number, card type, expiry date and the amount of items purchase to validate, whether the transaction is genuine or not. The implementation techniques of Hidden Markov Model in order to detect fraud transaction through credit cards, it create clusters of training set and identify the spending profile of cardholder. The number of items purchased, types of items that are bought in a particular transaction are not known to the Fraud Detection system, but it only concentrates on the amount of item purchased and use for further processing. It stores data of different amount of transactions in form of clusters depending on transaction amount which will be either in low, medium or high value ranges. It tries to find out any variance in the transaction based on the spending behavioral profile of the cardholder, shipping address, and billing address and so on. The probabilities of initial set have chosen based on the spending behavioral profile of card holder and construct a sequence for further processing. If the fraud detection system makes sure that the transaction to be of fraudulent, it raises an alarm, and the issuing bank declines the transaction. For the security purpose, the Security information module will get the information features and its store's in database. If the card lost then the Security information module form arises to accept the security information. The security form has a number of security questions like account number, date of birth, mother name, other personal question and their answer, etc. where the user has to answer it correctly to move to the transaction section. All these information

5. ADVANTAGES

a) A hybrid technique to detect credit card frauds is presented in this paper. Credit card fraud detection using the HMM algorithm along with MAC address and shipping address is very useful and efficient in solving the frauds related to credit card and thus prevents frauds and gives enhanced security and protection against online frauds.

b) The detection of the fraud use of the card is found much faster that the existing system.

c) The main feature of the HMM-based model is reducing in False Positive(FP) transactions predict as fraud by a fraud detection system even though they are really genuine customer.

6. CONCLUSION

A hybrid technique to detect credit card frauds is presented in this paper. That technique uses the properties of PGNN and CBM to provide an efficient fraud detection technique. And overcome the limitations of the existing technique. A brief description over the proposed technique is presented in section IV Proposed Methodology. To evaluate the performance of the proposed technique Precision, Recall and F-measures are used as evaluation parameters. For future work enhanced

security mechanism can be used, in which password and password entering behavior of the user is used to teach the authentication for any transaction.

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