A Cross Methodology for Credit Card Deception Recognition Using Cryptography with Data Mining Technique

S. Vishali
Department of Computer Science and Technology,
Sri Sivani College of Engineering,
Srikakulam, Andhra Pradesh 532402, India.

Dr. Rajendra Kumar Ganiya
Department of Computer Science and Technology,
Sri Sivani College of Engineering,
Srikakulam, Andhra Pradesh 532402, India.

1. ABSTRACT

Banks are increasingly using information technology for improving the quality of customer services and also for better marketing of their products. Thus, technology has converted the traditional brick -and -mortar banking into e-banking. In the credit card transaction credit card credentials for online transaction and physical card for offline transaction is used. When physical card is given for the transactions, the credit card details or the card itself can be stolen and if the owner of the card is not aware about the loss of card it may result in the fraudulent transactions by unauthorized users and the financial company is at the loss .Credit Card is plastic money and is widely used as a mode of payment. Credit card owners are increasing at a high rate and all users transact with a sense of security and confidence, hence credit card security is a prime concern for online transactions. It is important to safeguard the process so that the e-commerce platform providers as well as the credit card providers along with the user using the credit card are not at a loss. Secure services can be provided only with a reliable and safe model to protect the transaction . But it is obvious that the number of credit card fraud cases is constantly increasing in spite of the chip cards worldwide integration and existing protection systems.

This is why the problem of fraud detection is very important now. In this paper the general description of the developed fraud detection system and comparisons between models based on using of data mining technique and cryptography techniques which can be used in credit card fraud detection mechanisms.

Keywords: **Plastic Money, Banking, Credit card, ATM Card**

2. INTRODUCTION

In the credit card transaction credit card credentials for online transaction and physical card for offline transaction is used. When physical card is given for the transaction, the credit card details or the card itself can be stolen and if the owner of the card is not aware about the loss of card it may result in the fraudulent transactions by unauthorized users and the financial company is at the loss.

Credit-card-fraud [1-5] 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.

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 [7] refer as data mining technique generally detected for fraud detection. 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.The use of credit cards and debit cards are increasing day by day. People are relying more on both cards nowadays than in the previous days. As credit cards and debit cards becomes the most popular mode of payment for both online as well as regular purchase, cases of fraud associated with it are also rising.

In real life, fraudulent transactions are scattered with genuine transactions and simple pattern matching techniques are not often sufficient to detect those frauds accurately. In this project the process of Cryptography [6] has been followed, it is one of the most important security technologies which used to secure the data transmission and the data itself. As the time and challenge growth, the cryptography also grows up with variety of encryption techniques and algorithms. Proposed system provided the security alerts for credit card users while performing the transactions by unauthorized users or fraud transactions detected through implementing sending mails, generate OTP based on Decision Tree Technique.

The performance of the proposed system provides the good accuracy, good performance through implementing the dynamic rough set theory.

Credit Card:
Credit cards is a substitute for cash which can be used by selected customers of banks issuing the cards for their use for payment for goods and services Many company executives, Business man and high and middle income individuals are found to be eligible member customers of banks for issue of these cards [7]. These plastic cards will have the photo identity and his signature embossed on the card. It will also have the issuing Bank's name and validity period of the card. The bank issuing the credit cards knows the customer well and his creditworthiness.

Debit Card:
Debit Cards are machine readable, magnetically-encoded plastic cards, similar in appearance to credit cards. These are important because they could potentially replace cash, Cheque and Credit Cards in most retail transactions. Despite claims of cost savings and greater effiency, consumers and merchants have been reluctant to switch from traditional methods of payment to payments using debit cards.

Debit cards are of two types - signature- based and pin-based. Although signature –based debit cards offer higher revenue potential, customers are concerned about security threats [8]. The fees in case of pin-based debit cards are two -third lower than signature- based debit cards. signature based verification generates a fee of roughly 180 bps per transaction, which is quite less than credit card transactions, but is still healthy revenue

ATM Card:
An ATM is a computerized machine. It is an un attended electronic machine in a public place, which is connected to a data system and related equipment's. Automated Teller Machines has come in handy for the urban people to save time and energy for withdrawing money, instead of waiting for hours in queues. Now the boon is also available to villagers. They can have the advantages of on ATMs, that too sitting at their doorsteps. When a person open a bank account, he should get an ATM card or cash point card so that he can take money out of his account via an ATM [9]. Here electronically customer card is identified by code number and the customer's account is debited and is handed over to the customer.

2.1. Types of frauds
It is interesting to note that credit card fraud affect owner the least and merchant the most .The existing legislation and card holder protection policies as well as insurance scheme affect most the merchant and customer the least. Card issuer bank also has to pay the administrative cost and infrastructure cost .Studies show that average time lag between the fraudulent transaction date and charge

back notification can be high as 72 days, thereby giving fraudster sufficient time to cause severe damage. In this paper we address some solutions to detect credit card fraud as early as possible. The following section introduces some approaches on the basis of supervised and unsupervised learning. After that we explore the techniques that come under the supervised and unsupervised learning techniques before going on to result and conclusion. There are many types of frauds

2.1.1 Offline Fraud

Most offline fraud incidences happen as a result of theft of mail, sensitive information related to customers bank or credit card accounts, stolen ATM/debit/credit cards, forged/ stolen coequal etc [10]. customer can protect from such instances by exercising caution while receiving, storing and disposing customer account statements as well as Coequal, ATM/Debit and Credit Cards.

2.1.2 Online Fraud

Online fraud occurs when someone poses as a legitimate company (that may or may not be in order to obtain sensitive personal data and illegally conducts transactions on your existing accounts. Often called "phishing" (An online identity theft scam. Typically, criminals send emails that look like they're from legitimate sources, but are not. The fake messages generally include a link to phony, or spoofed, websites, where victims are asked to provide sensitive personal information. The information goes to criminals, rather than the legitimate business.) Or "spoofing" (An online identity theft scam. Typically, criminals send emails that look like they're from legitimate sources, but are not (phishing) [11]. The fake messages generally include a link to phony, or spoofed, websites, where victims are asked to provide sensitive personal information. The information goes to criminals, rather than the legitimate business.) , the most current methods of online fraud are usually threatening condition concerning Customer account. Some fake emails may also contain a virus known as a "Trojan horse" that can record Customer

keystrokes or could trigger background installations of key logging software or viruses onto computer. The virus may live in an attachment or be accessed via a link in the email. Never respond to emails, open attachments, or click onlinks from suspicious or unknown senders. If Customer not sure if a email sent by Bank is legitimate, Report it to Bank, without replying to the email.

3. SCOPE OF THE STUDY

The paper money has small life cycle and can't be recycled as compared to plastic money which has long life cycle and can be recycled for further utilization. Due to this problem faced with the paper note the invention of plastic money has been introduced. Plastic money is secured and cannot be copied. Australia is the first country to have all polymer barometer [12], the rest of the world is starting to follow the lead. Another problem that arises is that one cannot keep the huge amount of cash with oneself and this gave an impetus to the idea of plastic cards which is known as plastic money accepted worldwide and one can keep the huge amount with oneself while going anywhere in the world.

Online businesses gave birth to e-commerce platforms which in turn use digital modes of transaction such as credit-card, debit card etc. This kind of digital transaction attracted millions of users to transact on the internet. Along came the risk of online credit card frauds. The need to have secure payment transactions across and many techniques based on Neural Network, Decision Tree, Artificial Intelligence, Artificial Immune System, Fuzzy based systems [13], Nearest neighbor algorithm, Support Vector Machines, Genetic Algorithm were developed to detect the fraudulent online credit card transactions. Hence the need to have secure payment transactions arose and many techniques based on Neural Network, Decision Tree, Artificial Intelligence, Artificial Immune System, Fuzzy based systems, Nearest neighbor algorithm, Support Vector Machines, Genetic Algorithm were developed to detect the fraudulent online credit card transactions. This thesis presents hybrid Approach for Credit Card Fraud

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detection using Dynamic Rough Set and Data Mining Technique which can be used in credit card fraud detection mechanisms [14].

4. METHODOLOGY

Fraud act as the wrongful or criminal deception intended to result in financial or personal benefit. It is a deliberate act that is against the law, rule or policy with a aim to attain unauthorized financial benefit. I have been successfully applied to detect legitimate or fraudulent transactions. Association Rules can be applied to detect fraud. Linda Delaware and Point on et.al use the association rules to extract knowledge so that normal behavior pattern may be obtained in unlawful transaction In this approach, each transaction is scored and based on these score transactions are divided into fraudulent or legitimate transactions [15]. They focused on a solution to minimize the wrongly classified transactions. They merge the Meta heuristic approaches scatter search and genetic algorithm. Peer group analysis made by David Weston and Whit row is a good solution regarding credit card fraud detection. Peer group analysis is a good approach that is based on unsupervised learning and it monitors the behavior over time as well. This peer group technique can be used to find anomalous transaction and help to detect the fraud in time.

Various techniques for credit card fraud detection system
In credit card fraud detection there are many methods here we present survey of some most powerful method Credit card detection methods

- Decision tree
- Rough set
- Cryptography

4.1 CRYPTOGRAPHY ALGORITHM

Cryptography is about constructing and analyzing protocols that prevent third parties or the public from reading private messages; various aspects in information security such as data confidentiality, data integrity,

authentication, and nonrepudiation are central to modern cryptography [16]. Modern cryptography exists at the intersection of the disciplines of mathematics, computer science, and electrical engineering. Applications of cryptography include military communications, electronic commerce, ATM cards, and computer passwords.

4.1.1 RANDOM ENCRYPTION:

Character type cipher is always used in web application system and can be deciphered by the illegal users through "run dictionary", so, a new random encryption algorithm for character type cipher is put forward in this paper. The encryption parameters are randomly generated in the algorithm, and random confusion is adopted in the cipher text structure, so the same plaintext can produce different cipher texts, the experimentation shows that the algorithm is feasibility and validity.

CRYPTOGRAPHY ALGORITHM
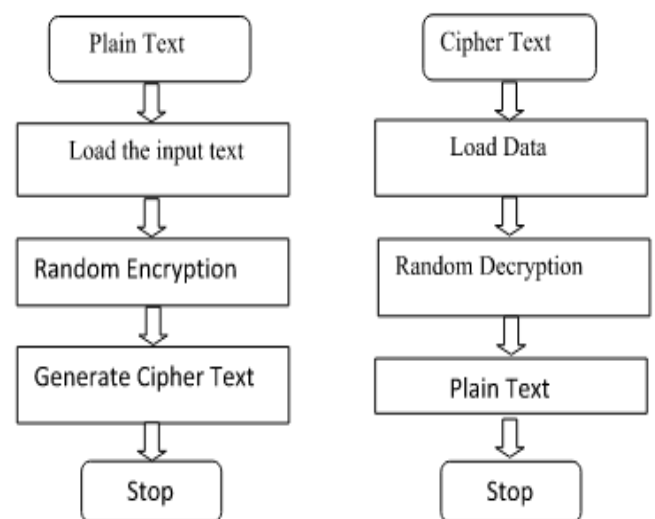
4.2 DATA MINING ALGORITHM

Data mining techniques have become one of the most powerful and popular approaches in knowledge discovery and it is very user friendly because final decision will take based on user decision , the science and technology of exploring large and complex of data in order to discover useful patterns. Decision Tree was

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originally implemented in decision theory and statistic or highly effective tool another areas such as Data Mining [17], Text Mining, Information extraction and Machine learning. Decision Tree is a method commonly used in Data Mining. Data mining is a classifier in the form of tree structure.

A data mining technique is a decision support tool that uses a tree-like graph or model of decisions and their possible consequences, including chance event outcomes, resource costs, and utility. It is one way to display an algorithm. Data mining techniques are commonly used in operations research, specifically in decision analysis, to help identify a strategy most likely to reach a goal, but are also popular tool in machine learning. Overview: A data mining technique is a flowchart-like structure in which each internal node represents a "test" on an attribute (e.g. whether a coin flip comes up heads or tails), each branch represents the outcome of the test, and each leaf node represents a class label (decision taken after computing allattributes). The paths from root to leaf represent classification rules.

In decision analysis, a decision tree and the closely related influence diagram are used as a visual and analytical decision support tool, where the expected values (or expected utility) of competing alternatives are calculated.

4.3 ROUGH SET ALGORITHM

In our system we have implemented the dynamic Rough set algorithm is a mathematical formulation for the data analysis. The rough se theory concept works on the grouping or making the similar clusters that holds entities that are undetectable for some futures such as temperature, motivational factor of human, socialized index etc., these features are the basic augmenting facts of knowledge that tells about the reality, and used for discovering a secret pattern in a given data set. The introduction of the rough set theory can be discovered in Pal and Skowron (1999).

4.3.1 ROUGH SET THEORY: BASIC CONCEPTS

Rough set theory basically depends on data set means collection of tables data or group of tables data represented. In real world the data is generally represented in the table format called data table, data table is also referred as database or attribute value table. In the data table matrix representation objects are represented or labeled with row and attributes are represented with the columns. Entries entered into the matrix are called attribute values

Rough set approach has many advantages that make understand to use this approach in industrial and decision making process such as searching a data pattern in dataset, making a decision rules, result can be understood easily also can be applied quantitative data etc. So the rough set theory display have its own advantage and can be applied to the various fields of industrial application process control and it can also be combined with the other existing techniques such as Data mining algorithm and Cryptography Algorithms

5. EXISTING SYSTEM

Credit Card is plastic money and is widely used as a mode of payment. Credit card owners are increasing at a high rate and all users transact with a sense of security and confidence, hence credit card security is a prime concern for online transactions. It is important to safeguard the process so that the e-commerce platform providers as well as the credit card providers along with the user using the credit card are not at a loss. Secure services can be provided only with a reliable and safe model to protect the transaction so this system fails while providing the security for credit card users to performing the online transactions.

6. PROPOSED WORK

In this work is meant for improving the credit card fraud detection. is made up of various important facts, these are mentioned as follows: To propose the Decision Tree Classification Algorithm and Cryptography Algorithms for maintain the security while using the credit cards .By

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using random encryption and decryption technique for storing the user credentials in secure format. To propose random number generation based on data mining technique for sending the one time password to mail which is used for online transactions .Rough sets theory was introduced as a mathematical tool for data analysis so oursystem will provide the good performance. Data preprocessingreducesthe data complexity and offers better chances for subsequent analysis. The best features can be found bydetermining the dependency between any conditional feature and the decision feature. Features with higher dependency values are taken in the final subset of best features.

- Preprocessing using Rough Set
- Rough sets theory was introduced as a mathematical tool for data analysis.

Data preprocessing reduces the data complexity and offers better chances for subsequent analysis.

- The best features can be found by determining the dependency between any conditional feature and the decision feature.
- Among decision support tools, decision trees (and influence diagrams) have several advantages.
- Decision trees Are simple to understand and interpret. People are able to understand decision tree models after a brief explanation.
- To propose the Decision Tree Classification Algorithm and Cryptography Algorithms for maintain the security while using the credit cards.
- By using random encryption and decryption technique for storing the user credentials in secure format. To propose random number generation based on data mining technique for sending the one time password to mail which is used for online transactions. Rough sets theory was introduced as a mathematical tool for data analysis so our system will provide the good performance.
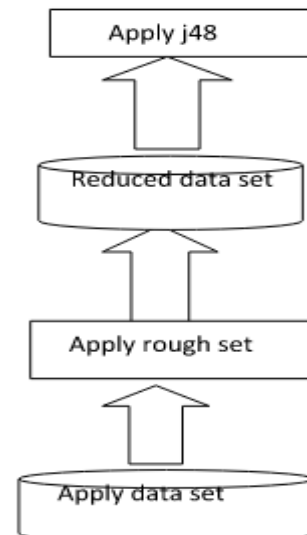
Data Flow Diagram:
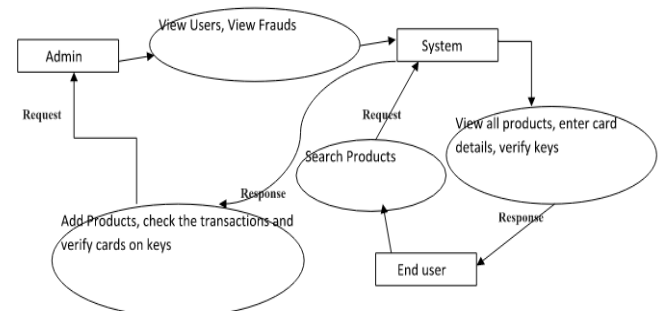
7. MODULE DESCRIPTION:
7.1 Admin/User Module:
In our proposed system provide the login credentials for every user so every user can login to our system by using their credentials but Admin can create the new user only. Every user credentials storing and retrieving based cryptography system while creating the new user and login user.

Purchase & Billing Module:
This module is used for selecting the items from stock which items they want and generate the bill. After generating the bill if user wants to pay the money by using credit cards then system generate the OTP based on decision tree technique, by using this OTP money transaction performed.

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Update Module:

In this module user can modify or update their profile based on user ID and security questions which are mentioned while user registration. Main use of this functionality is modified their credentials and security questions, answers while hacking their credentials by hackers.

8. CONCLUSION

Due to Fulsome advancement in technology, the use of credit card has increased and due to this, Fraud cases are affecting it directly. One of the main motives of this study is to explore as many techniques that can detect fraud effectively. If one of the above technologies is applied in bank then cases of credit card fraud will surely minimize. Here we represent the advanced technologies that can detect credit card fraud and save the bank from big loss.data mining technique and cryptography techniques proposed in this paper to make effective classification for detecting the fraud attacks. The fraud detection systems in credit card transactions need to be very robust and precise, giving minimum false alerts and exactly classifying the fraud and non-fraud transactions. Proposed system provided the security alerts for credit card users while performing the transactions by unauthorized users or fraud transactions.

9. BENEFITS

The project is identified by the merits of the system offered to the user. The merits of this project are as follows:

- It's a web-enabled project.
- This project offers user to enter the data through simple and interactive forms. This is very helpful for the client to enter the desired information through so much simplicity.
- The user is mainly more concerned about the validity of the data, whatever he is entering. There are checks on every stages of any new creation, data entry or updating so that the user cannot enter the invalid data, which can create problems at later date.

- Sometimes the user finds in the later stages of using project that he needs to update some of the information that he entered earlier. There are options for him by which he can update the records. Moreover there is restriction for his that he cannot change the primary data field. This keeps the validity of the data to longer extent.
- User is provided the option of monitoring the records he entered earlier. He can see the desired records with the variety of options provided by him.
- Data storage and retrieval will become faster and easier to maintain because data is stored in a systematic manner and in a single database.
- Decision making process would be greatly enhanced because of faster processing of information since data collection from information available on computer takes much less time than manual system.
- To propose the Decision Tree Classification Algorithm and Cryptography Algorithms for maintain the security while using the credit cards.
- By using random encryption and decryption technique for storing the user credentials in secure format.
- To propose random number generation based on data mining technique for sending the one time password to mail which is used for online transactions.
- Decision Tree algorithm is used for perform the online transactions based on user decision by generating the random OTP creation. In proposed system implemented the Encryption & Decryption algorithms for protect the security for data and at the same time maintain the security for user transactions.

References

[1] Credit Card Fraud Statistics-2013,<http: www.cardhub.com/edu/creditfraud-statistics >, 5 Feb, 2015.

[2] A Tale of two fraud stats, <www.pymts.com/in-depth/2014/a-tale-oftwo-fraud-stats/#.VN01GJ3F9PS >, 5 Feb,2015.

[3] Online fraud is 12 times higher than offline fraud,<http://sellitontheweb.com/ezine/news0434.shtml> , 20 June, 2007

[4] E. Duman, and M.H. Ozcelik, "Detecting credit card fraud by genetic algorithm and scatter search," Expert Systems with Applications, 38,pp. 13057–13063, 2011.

[5] S. Ghosh and D.L.Reilly, "Credit card fraud detection with a neuralnetwork,"in: Proceedings of the Annual International Conference onSystem Science, pp. 621–630, 1994.

[6] E. Aleskerov, B. Freisleben& B. Rao, "CARDWATCH: a neuralnetwork based database mining system for credit card fraud detection,"in: Proceedings of the Computational Intelligence for FinancialEngineering, pp. 220–226, 1997.

[7] J. T. S. Quah and M. Srinagesh, "Real-time credit fraud detectionusing computational intelligence," Expert Systems with Applications,35, pp. 1721–1732, 2008

[8] S. Panigrahi, A. Kundu, S. Sural, & A. Majumdar, "Credit card frauddetection a fusion approach using Dempster–Shafer theory andbayesian learning," Information Fusion, pp. 354–363, 2009.

[9] A. Shrivastava, A. Kundu, S. Sural and A.K. Majumdar, "Credit CardFraud Detection using Hidden Markov Model," IEEE transactions ondependable and secure computing, Vol. 5, pp.37-48, 2008.

[10] S. Maes, K. Tuyls, B. Vanschoenwinkel and B. Manderick, "Creditcard fraud detection using Bayesian and neural networks," in:Proceedings of the First International NAISO Congress on NeuroFuzzy Technologies, 2002.

[12]A Novel Dual Phase Mechanism for Data Transmission to Provide Compression and Security ,International Journal of Advanced Research in Computer Science and Software Engineering Volume 3, Issue 12, December 2013 ISSN: 2277 128X

[13]A Novel Methodology for Secure Communications and Prevention of Forgery Attacks (0975 - 8887) ,International Journal of Computer Applications Volume 96 - Number 22 Year of Publication: 2014

[14]Communication within Sensor Networks by Using Key Distributor , International Journal of Computer Science and Information Technologies, Vol. 5 (4) , 2014, 4906-4910

[15]Enhancement of Finger Print Image using Fuzzy Filter ,International Journal of Computer Applications.Volume 120 - Number 3 Year of Publication: 2015.ISBN : 973-93-80887-42-0

[16]A Novel Approach for Secure Communication of Text Using Compression Mechanism ,International Journal of Computer Science and Technology IJCST/62/1/A-0491 IJCST Vol 6, Issue 2, Ver. 2 (April - June 2015)

[17]A Similitude Study on Weighted Pagerank and Enhanced Ratiorank Algorithms Using Visit of Links of a Web Page ,International Journal of Computer Science and Information Technologies (IJCSIT),Vol. 6 (3) , 2015.

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