Online Credit Card Fraud Detection

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Abstract — **A phenomenal growth in the number of credit card transactions, especially for online purchases, has recently led to a substantial rise in fraudulent activities. Implementation of efficient fraud detection systems has thus become imperative for all credit card issuing banks to minimize their losses. In real life, Fraudulent transactions are interspersed with genuine transactions and simple pattern matching is not often sufficient to detect them accurately. Past history of transactions like card holders' spending pattern from the previous transaction database, and other inputs like income, location, living expense etc can be compared with the current transaction details to detect credit card frauds. Deviation on transactions can indicate a fraud. To detect this fraud we are explaining methods like Clustering, Neural Network based on Outlier Detection Technique.**

Keywords— Clustering, Data mining, neural network, fraud, cluster.

I. INTRODUCTION

The main objective of the existing system is to provide a user-friendly interface. The College ERP system now computerizes all the details that are maintained manually. Once the details are fed into the system or computer there is no need for various persons to deal with separate sections. Only a person is enough to maintain all the reports and records. The security can also be given as per the user requirement.

- High volumes of data can be stored with case.
- Maintenance of file is efficient and flexible.
- Records are always updated.
- Edition of Stored data and procedures can be easy.
- Reports can be generated with cases.
- Accurate and perfect calculations are made.
- Manpower is reduced.

Credit cards have become a popular tool for transaction in many countries lately. However, the popular use of credit cards is accompanied by many fraudulent transactions, which cost hundreds of millions of dollars annually. It is, thus, very crucial to use an effective method to solve this problem and decrease losses caused by fraud.

Fraud is one of the major ethical issues in the credit card industry. The main aims are, firstly, to identify the different types of credit card fraud, secondly, to review alternative techniques that have been used in fraud detection. In handling the credit card fraud problem, conventionally past real transaction data are used to create models for predicting a new case

This system proposes a credit card fraud detection model using outlier detection based on distance sum according to the infrequency and unconventionality of fraud in credit card transaction data, applying outlier mining into credit card fraud. Hence in this system we are trying to analyze various techniques of the Fraud through SVM and ANN. We are going to implement outlier mining technique for the credit card fraud detection system.

The main objective behind our system is to analyze different techniques and find the most appropriate technique which not only helps us to minimize the fraud but also help in future enhancement in the system. Fraud is defined as the use of one's asset for personal enrichment through misbehavior. In real world fraudulent activity may occur in many areas such as online banking, merce, mobile communications and telecommunication networks. Fraud is increasing drastically with globalization and modern technology which results in major loss to the businesses. Fraud detection refers to the act of identifying frauds as early as possible. In recent years fraud detection has been implemented using techniques such as neural networks, data mining, statistics, clustering etc.

II. LITERATURE SURVEY

Existing System-

In case of the existing system the fraud is detected after the fraud is done that is, the fraud is detected after the complaint of the card holder. In the existing system discriminate analysis and regression analysis are widely used which can detect fraud by credit rate for cardholder's and credit card transaction.

Proposed System-

In this proposed system we are doing the analysis of different techniques of fraud detection which is user friendly and secure. This system analyzes the feasibility of credit card fraud detection based on outlier mining, applies outlier detection mining based on distance sum into credit card fraud detection and proposes this detection procedures and its empirical process.

III. DESCRIPTION ABOUT THE PROPOSED

3.1.1 Methodology, Techniques and algorithms

Clustering Method

Techniques-

Outlier Mining
Neural Network

Algorithm-

K-Means Algorithm-

Let $X = \{x_1, x_2, x_3, \ldots\ldots, x_n\}$ be the set of data points and $V = \{v_1, v_2, \ldots\ldots, v_c\}$ be the set of centers.

1) Randomly select 'c' cluster centers.

2) Calculate the distance between each data point and cluster centers.

3) Assign the data point to the cluster center whose distance from the cluster center is minimum of all the cluster centers.

4) Recalculate the new cluster center using:

$$v_i = (1/c_i) \sum_{j=1}^{c_i} x_j$$

Where, 'c_i' represents the number of data points in i^{th} cluster.

5) Recalculate the distance between each data point and new obtained cluster centers.

6) If no data point was reassigned then stop, otherwise repeat from step 3).

ANN Algorithm-

1) Collect time-varying data with an online questionnaire system.

2) Data preprocessing

3) Train data and build up a personalized model by SVM and ANN. And test this data.

4) Predict a new transaction to be normal or not.

5) If yes, the transaction is genuine.

6) If no, the transaction is Fraudulent

3.1.2.Experimental setup

In our system there are five modules.

The modules are following

Login

Security information

Spending profile

Verification

Transaction

Login

In this module the user has unique card verification value (CCV) and One Time Password (OTP). For login, user is required to enter correct card number and password

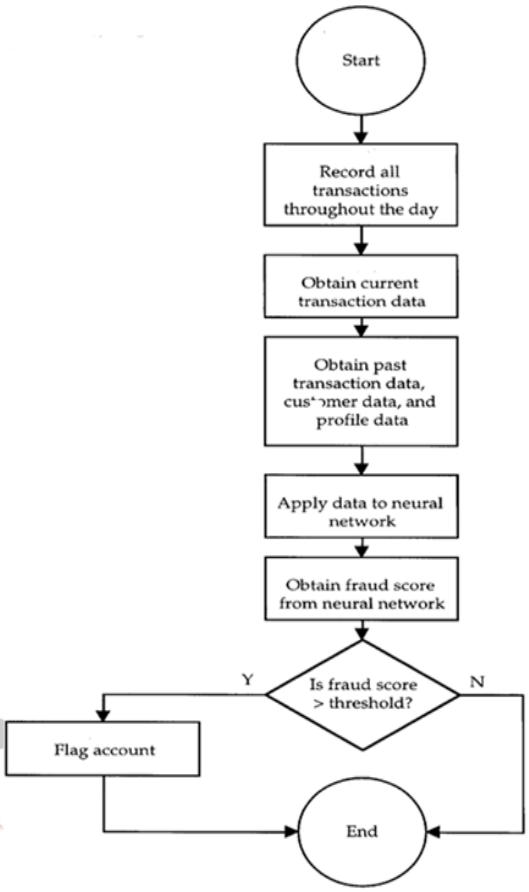

Fig 3.1 Design of proposed algorithm

Security information

In this module the security is provided to the cardholder's data and the transaction that he did. In this module the randomly questions are asked to the cardholder and then the answer given by the cardholder are compared to the database. If the comparison is true then only the cardholder is able to do the transaction. This provides the additional secure layer for transaction.

Spending Profile

This module deals with the overall profile of the user which is related to the transaction. This module generally includes the average amount per transaction, average daily spending, and times of using card and so on. This record is compared with the current transaction which helps for verification.

Verification

Verification module verifies whether user entered his data correctly or not. This enables the system to detect whether user is genuine or fraudster.

Transaction

Transaction is the main module. This module is performed after the verification and if the user is not the fraudster then only the transaction is performed according to the cardholder want.

3.1.3. Execution steps

The customer places an order on the merchant's website after selecting and adding items in the shopping cart.

The Customer details are sent from EBS to the acquiring bank, the acquiring bank then sends the details for authentication.

Then customer has to login to his Bank-Account by providing logging details (i.e. username and password)

Then purchased amount of the customer will be displayed. The customer is request to enter his credit card number and card verification value (CVV).

IV. CONCLUSION

In this paper, we described and analyze two methods of Credit Card Fraud Detection of Oulier detection Technique and HMM model based on Clustering. We are trying to obtain best algorithm as a solution by comparing existing algorithms which will minimize the frauds.

The fundamental problem in maintaining and managing the work by the administrator is hence overcome. Prior to this it was a bit cumbersome for maintaining the time table and also keeping track of the daily schedule. But by developing this web-based application the administrator can enjoy the task, doing it ease and also by saving the valuable time. The amount of time consumption is reduced and also the manual calculations are omitted, the reports can be obtained regularly and also whenever on demand by the user. The effective utilization of the work, by proper sharing it and by providing the accurate results. The storage facility will ease the job of the operator. Thus the system developed will be helpful to the administrator by easing his/her task.

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