

Credit Card Fraud Detection Using Machine Learning

¹Shital V. Avhad, ²Nilam B. Avhad, ³Pooja K. Palve, ⁴Komal D. Sanap, ⁵Dr. Swati A. Bhavsar

Department of Computer Engineering
Matoshri college of engineering and research Centre
Eklahare, Nashik.

Abstract - Electronic trade or web-based business is a plan of action that lets organizations and people over the web trade anything. As of late, in the age of the Internet and sending to E-business, parts of information are put away and moved starting with one area then onto the next. Information that moved can be presented to risk by fraudsters. There is an enormous expansion in misrepresentation which is prompting the deficiency of a huge number of dollars worldwide consistently. There are different current methods of distinguishing extortion that is consistently proposed and applied to a few business fields. The primary undertaking of Fraud identification is to notice the activities of huge loads of clients to recognize undesirable conduct. To recognize these different sorts, information mining strategies and AI to have been proposed and carried out to decrease down the assaults. A quite some time ago, numerous strategies are used for misrepresentation discovery framework like Support Vector Machine (SVM), K-closest Neighbor (KNN), neural organizations (NN), Fuzzy Logic, Decision Trees, and numerous more. This large number of methods have yielded respectable outcomes yet expecting to further develop the precision even further, by fostering the actual strategies or by utilizing a crossover learning approach for distinguishing cheats.

Key Words: Monitoring, Credit Card, Authentication, security

INTRODUCTION

Presently in the innovation of days because of quick turn of events web utilization is all over the place. In today's development electronic world, numerous little and enormous organizations have put their organizations on to the WWW to offer types of assistance to client. Internet business draws on innovations like electronic asset move, online exchange handling, web banking, and mechanized information assortment frameworks, etc. Internet shopping will be well known step by step. Online business installment frameworks have become well known because of far and wide utilization of the web based shopping and banking. Quick augmentation of this time billions of dollars are lost consistently because of Visa misrepresentation. Misrepresentation is a demonstration of treachery planned for individual utilization or on the other hand to hurt a misfortune to somebody. Fraudster just needs to know the individual data identified with (card number, card expiry date and so on) It tends to be conceivable genuinely or for all intents and purposes. It is regularly comprehended as deceptive nature to acquire some benefit which is frequently monetary, over someone else. It very well may be seen in generally normal, securing or exchanging of property, including genuine property, Personal Property, and immaterial property, for example, stocks, bonds, and copyrights.[2].

LITRATURE SURVEY

1. Supervised Machine Learning Algorithms for Credit Card Fraud Detection: A Comparison, Samidha Khatri [1], In today's economic scenario, credit card use has become extremely commonplace. These cards allow the user to make payments of large sums of money without the need to carry large sums of cash. They have revolutionized the way of making cashless payments and made making any sort of payments convenient for the buyer. This electronic form of payment is extremely useful but comes with its own set of risks. With the increasing number of users, credit card frauds are also increasing at a similar pace. The credit card information of a particular individual can be collected illegally and can be used for fraudulent transactions. Some Machine Learning Algorithms can be applied to collect data to tackle this problem. This paper presents a comparison of some established supervised learning algorithms to differentiate between genuine and fraudulent transactions

2. Performance Analysis of Machine Learning Algorithms in Credit Cards Fraud Detection, Vinod Jain [2], Credit cards are very commonly used in making online payments. In recent years' frauds are reported which are accomplished using credit cards. It is very difficult to detect and prevent the fraud which is accomplished using credit card. Machine Learning (ML) is an Artificial Intelligence (AI) technique which is used to solve many problems in science and engineering. In this paper, machine learning algorithms are applied on a data set of credit cards frauds and the power of three machine learning algorithms is compared to detect the frauds accomplished using credit cards. The accuracy of Random Forest machine learning algorithm is best as compared to Decision Tree and XGBOOST algorithms.

3. A Survey On Fraud Detection Techniques in E-Commerce, Suha Mohcen Najem [3], Electronic commerce or e-commerce is a business model that lets companies and persons over the internet buy and sell anything. Recently, in the age of the Internet and forwarding to E-commerce, lots of data are stored and transferred from one location to another. Data that transferred can be exposed to danger by fraudsters. There is a massive increase in fraud which is leading to the loss of many billions of dollars worldwide every

year. There are various modern ways of detecting fraud that is regularly proposed and applied to several business fields. The main task of Fraud detection is to observe the actions of tons of users to detect unwanted behavior. To detect these various kinds, data mining methods & machine learning to have been proposed and implemented to lessen down the attacks. A long time ago, many methods are utilized for fraud detection system such as Support Vector Machine (SVM), K-nearest Neighbor (KNN), neural networks (NN), Fuzzy Logic, Decision Trees, and many more. All these techniques have yielded decent results but still needing to improve the accuracy even further, by developing the techniques themselves or by using a hybrid learning approach for detecting frauds.

4. Tharindu Madushan Bandara; Wanninayaka Mudiyanse; Mansoor Raza [4], In this paper, a review to describe the latest studies on fraud detection in e-commerce between (2018-2020), and a general analysis of the results-achieved and upcoming challenges for further researches. This will be useful for giving us complete visualization about how can we present the most suitable, most accurate methods for fraud detection in e-commerce transactions.

LIMITATION OF EXISTING SYSTEM

- Costing: The Existing system is high cost and this is main reason most of the system is failed.
- Technology Complexity: Most of system is the complex to understand, Not user friendly as compare to our proposed system
- Time Consuming Feature: In existing system, the performance is low and most of the time system gets hanged due to load.
- Not Easy to Understand: Systems re complex to understand and they were not user friendly

EXPERIMENTAL SETUP

Python:

django is a free, open-source[3] Python web framework, created by Taylor Otwell and intended for the development of web applications following the (MVC) architectural pattern and based on Symfony. Some of the features of django are a modular packaging system with a dedicated dependency manager, different ways for accessing relational databases, utilities that aid in application deployment and maintenance, and its orientation toward syntactic sugar. Taylor Otwell created django as an attempt to provide a more advanced alternative

to the CodeIgniter framework, which did not provide certain features such as built-in support for user authentication and authorization. django's first beta release was made available on June 9, 2011, followed by the django 1 release later in the same month. django 1 included built-in support for authentication, localisation, models, views, sessions, routing and other mechanisms, but lacked support for controllers that prevented it from being a true MVC framework.

Advantages of Python:

- Active Server Pages (ASP)
- Pure Servlets
- Server-Side Includes (SSI)

Operating System:

Windows 8 and above Windows is the most widely used operating system for desktop and laptop computers. Developed by Microsoft, Windows preliminary runs on x86 based computers. Windows provides Graphical User Interface and desktop Environment in which application displayed in resizable, movable windows on screen..

SQL LITE 3 Database:

SQL LITE 3 is an open source relational database management system (RDBMS). It uses a standard form of the well known SQL data language and works quickly and works well even with huge dataset.

SCOPE:

The future scope for credit card fraud detection systems using machine learning is quite promising, with new advancements and opportunities arising in this field. One area of focus is the development of more sophisticated machine learning algorithms that can detect and prevent fraud in real-time, even for highly complex and evolving fraud schemes.

Another area of potential growth is the integration of more advanced data processing and feature selection techniques, such as natural language processing and graph analysis, to identify subtle fraud patterns that may be difficult to detect with traditional approaches.

PROBLEM STATEMENT:

To design and develop system for credit card fraud detection that can accurately identify fraudulent transactions from a large dataset of credit card transaction. The model should be able to analyze various features of the transaction, such as the transaction amount, location, time, and other related information to detect patterns that are indicative of fraud.

The goal is to create highly accurate fraud detection system that can help financial institutions prevent losses due to fraudulent transactions while minimizing

false positive that can impact legitimate transactions. The model should be able to adapt to new patterns of fraudulent behavior and maintain high accuracy levels over time.

SYSTEM ARCHITECTURE

Figure:1 shows system architecture of credit card fraud detection system. The proposed of the system is to identify and prevent fraudulent transactions from occurring. This is important for both the credit card company and the customers using the credit card,

as it can help prevent financial losses and maintain the security of the system. Firstly user can be signup in the system with username and password, then login with same username and password. After that user can be go through either single analysis or file analysis for detect the fraudulent transaction or normal transaction.

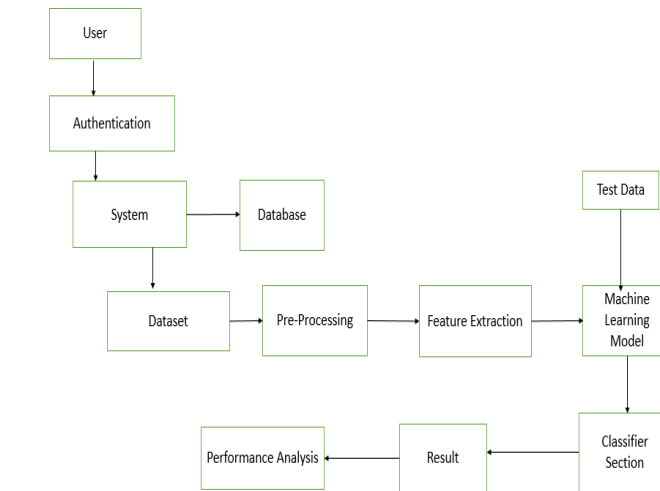


Fig -1: System Architecture Diagram

ADVANTAGES

1. Innovative.
3. Centralised Database.
4. Easy to use.
5. Efficient cost.

APPLICATION:

1. Ecommerce
2. Personals
3. Organizations

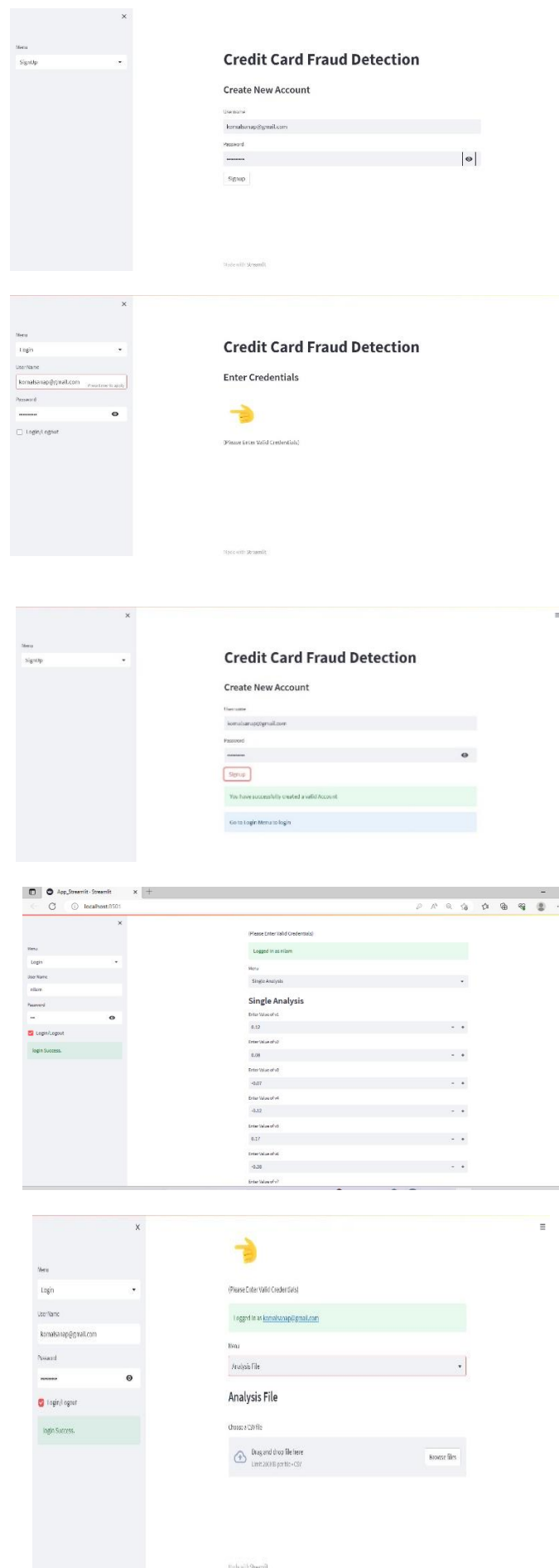
METHODOLOGY

The single problem can be solved by different solutions. This considers the performance parameters for each approach. Thus considers the efficiency issues.

- Problem Solving Methods are concerned with efficient realization of functionality. This is an important characteristics of Problem Solving Methods and should be deal with it explicitly.
- Problem Solving Methods achieve this efficiency by making assumptions about resources provided by their context (such as domain knowledge) and by assumptions about the precise definition of the task. It is important to make these assumptions explicit as it give the reason about Problem Solving Methods.

RESULTS





5. CONCLUSION

In conclusion, the credit card fraud detection system project using machine learning algorithms is a valuable and effective solution for preventing financial losses due to fraudulent transactions. The project involves the development of a system that can analyze large volumes of transactional data, identify patterns and anomalies that may indicate fraud, and classify transactions as either fraudulent or legitimate. The project typically involves data preprocessing, feature selection, algorithm selection, and hyperparameter tuning, as well as the development of a user-friendly interface for real-time fraud detection.

REFERENCES:

1. Aishwarya Arora; Arun Prakash Agrawal “ Supervised Machine Learning Algorithms for Credit Card Fraud Detection: A Comparison Samidha Khatri”, 10th International Conference on Cloud Computing, Data Science & Engineering (Confluence), 2020. <https://ieeexplore.ieee.org/document/9057851>.
2. T.F. Smith and M.S. Waterman, "Identification of Common Molecular Subsequences", *J. Molecular Biology*, vol. 147, no. 1, pp. 195-197, 2015.
3. C. Chiu and C. Tsai, "A Web Services-Based Collaborative Scheme for Credit Card Fraud Detection", *Proc. IEEE Int'l Conf. e-Technology e-Commerce and e-Service*, pp. 177-181, 2004..
4. V. Vatsa, S. Sural and A.K. Majumdar, "A Game-Theoretic Approach to Credit Card Fraud Detection", *Proc. Int'l Conf. Information Systems Security*, pp. 263-276, 2005
5. J.W. Slocum and H. Lee, "Mathews Social Class and Income as Indicators of Consumer Credit Behavior", *J. Marketing*, vol. 34, no. 2, pp. 69-74, 1970.
6. R. Wheat and D.G. Morrison, "Estimating Purchase Regularity with Two Interpurchase Times", *J. Marketing Research*, vol. 27, no. 1, pp. 87-93, 1990
7. B.E. Kahn and D.C. Schmittlein, "Shopping Trip Behavior: An Empirical. Investigation", *Marketing Letters*, vol. 1, no. 1, pp. 55-69, 1989.
8. K. Liano and J.T. Lindley, "An Analysis of the Weekend Effect within the Monthly Effect", *Rev. of Quantitative Finance and Accounting*, vol. 5, no. 4, pp. 419-426, 1995.
9. C.H. Joha, H.J.P. Timmermans and P.T.L. Popkowski-Leszczyc, "Identifying Purchase-History Sensitive Shopper Segments Using Scanner Panel Data and Sequence Alignment Methods", *J. of Retailing and Consumer Services*, vol. 10, no. 3, pp. 135-144, 2003
10. K. Takeda, "The Application of Bioinformatics to Network Intrusion Detection", *Proc. Int'l Carnahan Conf. Security Technology (CCST)*, pp. 130-132, 2005.