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Implementation towards Credit Card Fraud Detection

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ABSTRACT: People can use credit cards for online transactions as it provides an efficient and easy-to-use facility. With the increase in usage of credit cards, the capacity of credit card misuse has also enhanced. Credit card frauds cause significant financial losses for both credit card holders and financial companies. In this study, the main aim is to detect such frauds, including the accessibility of public data, high-class imbalance data, the changes in fraud nature, and high rates of false alarm. The main focus is to apply Deep Learning algorithm of the LSTM and RNN model by adding the additional layers for features extraction and the classification of credit card transactions as fraudulent or not. The main aim is to detect fraudulent transactions using credit cards with the help of deep learning algorithms. Feature selection algorithms are used to rank the top features from the CCF transaction dataset, which help in class label predictions. The deep learning model is proposed by adding a number of additional layers that are then used to extract the features and classification from the credit card fraud detection dataset. To analyse the performance both model, apply different architecture of layers. DL methods, are associated with the processing of text and the baseline model. Using these methods for the detection of credit cards yields better performance than traditional algorithm.

KEYWORDS: credit card, fraud detection, Machine learning, Deep Learning, Monetary losses.

I. INTRODUCTION

Nowadays Credit card usage has been drastically increased across the world, now people believe in going cashless and are completely dependent on online transactions. The credit card has made the digital transaction easier and more accessible. A huge number of dollars of loss are caused every year by the criminal credit card transactions. Fraud is as old as mankind itself and can take an unlimited variety of different forms. The PwC global economic crime survey of 2017 suggests that approximately 48% of organizations experienced economic crime. Therefore, there's positively a necessity to unravel the matter of credit card fraud detection. Moreover, the growth of new technologies provides supplementary ways in which criminals may commit a scam. The use of credit cards is predominant in modern day society and credit card fraud has been kept on increasing in recent years. Huge Financial losses have been fraudulent effects on not only merchants and banks but also the individual person who are using the credits. Fraud may also affect the reputation and image of a merchant causing non-financial losses that. For example, if a cardholder is a victim of fraud with a certain company, he may no longer trust their business and choose a competitor. Fraud Detection is the process of monitoring the transaction behaviour of a cardholder to detect whether an incoming transaction is authentic and authorized or not otherwise it will be detected as illicit.

In this proposed project we designed a protocol or a model to detect the fraud activity in credit card transactions. This system is capable of providing most of the essential features required to detect fraudulent and legitimate transactions. As technology changes, it becomes difficult to track the Modelling and pattern of fraudulent transactions. With the rise of machine learning, artificial intelligence, and other relevant fields of information technology, it becomes feasible to automate this process and to save some of the intensive amount of labour that is put into detecting credit card fraud.

Paper is organized as follows. Section II describes literature survey and related work done for fraud detection. The system diagram represents the proposed methodology, modules and algorithms used in process. After detection of fraud, how technique that is given in Section III. Section IV presents experimental results showing results of fraud tested. Finally, Section V presents conclusion.



II. RELATED WORK

1. "Fraud Detection Techniques for Credit Card Transactions,"

The problem of detecting a credit score includes modeling of past transactions for creditcards with the facts of those who have been revealed to fraud. The version is then used to delay whether new transactions are fraudulent or are now not new transactions. Our goal here is to detect 100% of fraudulent transactions and minimize fraudulent misclassification. Credit score card fraud detection is a common class model. In this method, we focused on the analysis and preprocessing of several anomaly detection algorithms and record sets, such as "neighbor outliers" and "forest zone isolation" algorithms, in PCA-converted credit card transaction statistics [1].

2. "Fraud Detection in Credit Card Transactions Using SVM and Random Forest Algorithms,"

It is critical for all banks that issue credit cards to reduce the cost of implementing an effective fraud detection system. One of the most difficult challenges is that neither the card nor the cardholder is needed to complete the transaction during a credit card transaction. Thus, the seller cannot verify whether the customer who is making an acquisition is an authentic cardholder or not. The accuracy of detecting fraud is improved with this system proposed using random forest algorithm, decision tree, and support vector machine algorithms. A random forest algorithm is a classification process for observing the data set and optimizing the accuracy of the resultant data. The techniques' performance is judged based on precision, sensitivity, & accuracy. Some of the data provided are processed to identify fraud detection and provide visualization for the graphic model. [2].

3. "Fraud Detection in Credit Card Data using Unsupervised Machine Learning Based Scheme,"

Fraud transactions in credit card data transaction are increasing each year. In this direction, researchers are also trying the novel techniques to detect and prevent such frauds. However, there is always a need of some techniques that should precisely and efficiently detect these frauds. This paper proposes a scheme for detecting frauds in credit card data which uses a Neural Network (NN) based unsupervised learning technique. Proposed method outperforms the existing approaches of Auto Encoder (AE), Local Outlier Factor (LOF), Isolation Forest (IF) and K-Means clustering. Proposed NN based fraud detection method performs with 99.87% accuracy whereas existing methods AE, IF, LOF and K Means gives 97%, 98%, 98% and 99.75% accuracy respectively [3].

4. "Performance Analysis of Machine Learning Algorithms in Credit Cards Fraud Detection,"

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 [4].

5. "Credit Card Fraud Detection Using State-of-the-Art Machine Learning and Deep Learning Algorithms,"

The relevant literature presents many machine learning based approaches for credit card detection, such as Extreme Learning Method, Decision Tree, Random Forest, Support Vector Machine, Logistic Regression and XG Boost. However, due to low accuracy, there is still a need to apply state of the art deep learning algorithms to reduce fraud losses [5].
algorithm.



III. METHODOLOGY

A) System Architecture:

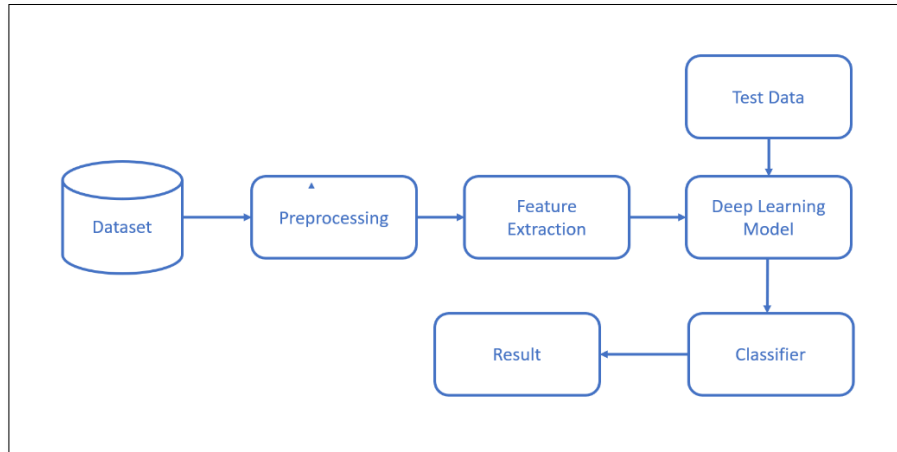
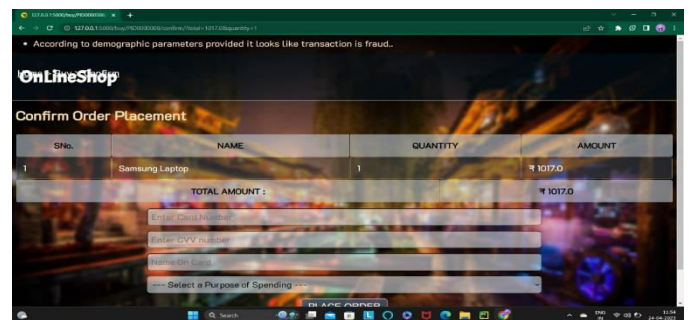
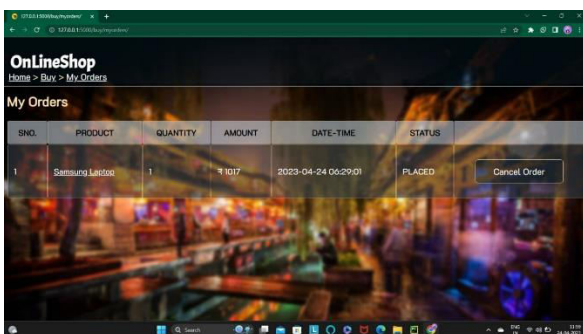


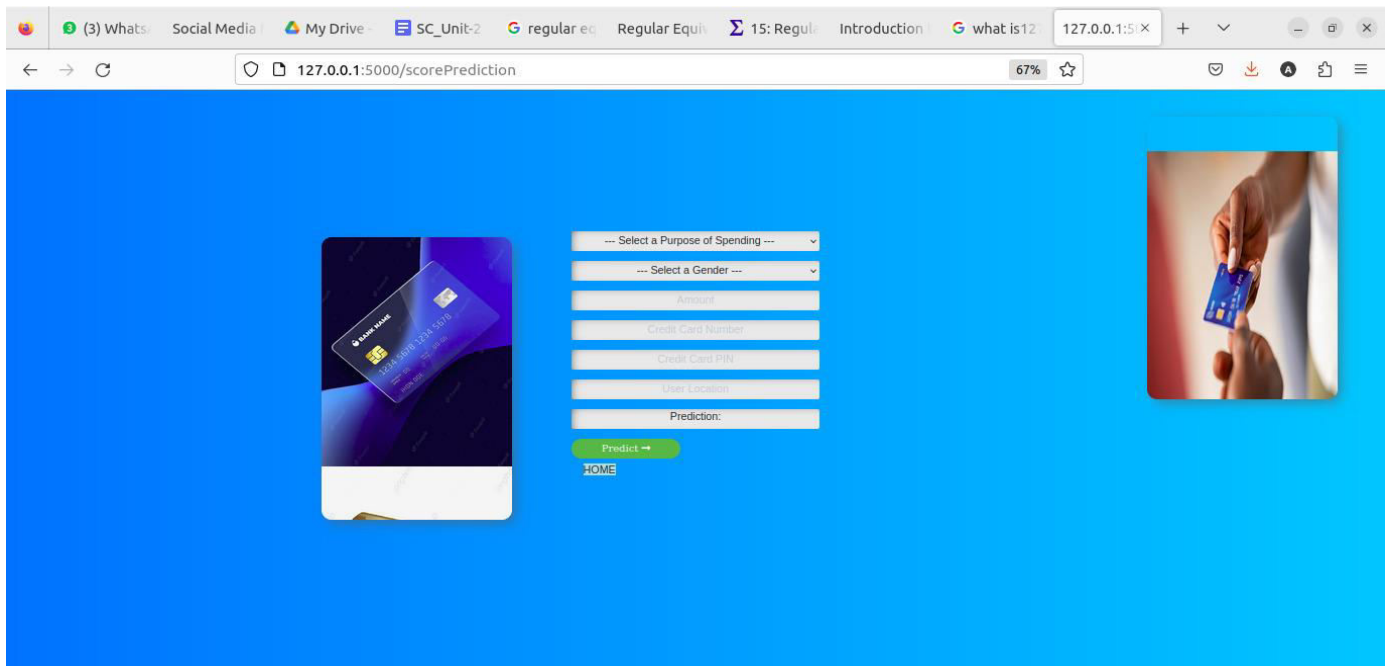
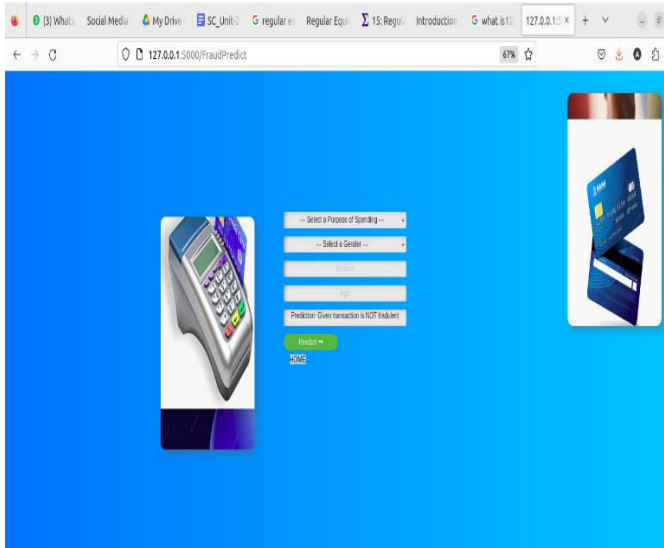
Fig 1: System Architecture

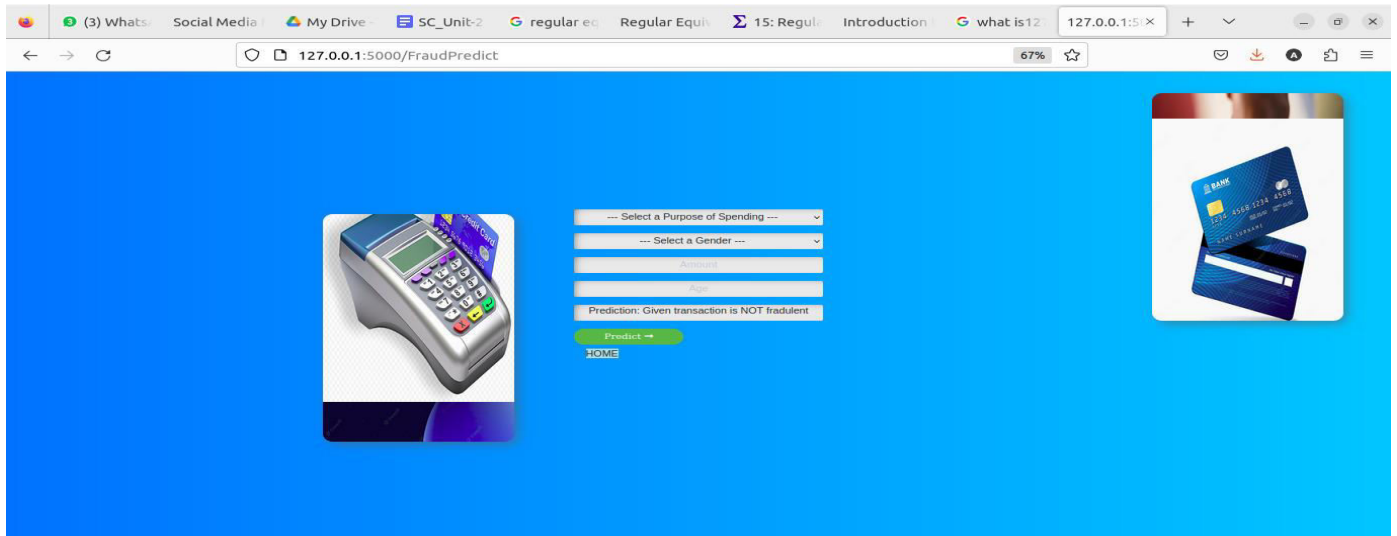
The architecture explains following:

- Dataset & Pre-processing: The ready dataset is taken for credit card fraud detection. A technique which is used to transform the raw data in a useful and efficient format.
- Feature Extraction: The required features are extracted to train the model.
- Model & Classifier: The model is trained with data and classified.
- Test Data: After the model is built, testing data once again validates that it can make accurate predictions. If training and validation data include labels to monitor performance metrics of the model, the testing data should be unlabeled. Test data provides a final, real-world check of an unseen dataset to confirm that the ML algorithm was trained effectively.

IV. EXPERIMENTAL RESULTS







V. CONCLUSION

The main objective of the system is the identification of credit card fraud. This system proposes a method which not only involves simple construction with associated attributes but is with better algorithms to detect Fraud. The proposed application will improve the level of awareness and identification of the fake or counterfeit in circulation to the people who used cash transactions regularly in their various businesses.

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