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Credit Card Fraud Detection Using Deep Learning

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ABSTRACT

There is a rising issue in today's financial sector with credit card fraud. An rise in the number of fraudulent operations is generating a significant financial loss for numerous organizations, corporations, and government bodies. Many academics in this sector are focusing on identifying fraudulent conduct early using powerful Deep learning approaches since the numbers are projected to grow in the future. However, detecting credit card fraud is not an easy process due to two primary reasons: I the fraudulent conduct is generally different for each attempt and (ii) the dataset is highly skewed, i.e. the frequency of the majority samples (genuine instances) outnumbers the minority samples (fraudulent cases).

A new fraud detection algorithm for streaming transaction data will be developed in order to evaluate prior client transaction information and extract behavioural patterns. Transaction amount is used to categorize cardholders into various groupings For each set of cardholders, a sliding window method is used to aggregate their transactions so that the corresponding behavioural patterns may be identified. After that, several classifiers are trained on the various subsets of data. Then, the classifier with the highest rating score may be selected as one of the best approaches for predicting fraud. Convolutional Neural Networks (CNNs) and K Nearest Neighbour (KNN) and naive bayes may be used to overcome this challenge and forecast frauds using K Nearest Neighbour (KNN)). As a result, a feedback system was implemented to address the issue of notion drift. This article used Convolutional Neural Networks (CNN) and fuzzy logic(FL) to analyze a dataset of European credit card fraud

INDEX TERMS. Deep learning,fraud detection, Convolutional Neural Networks, K Nearest Neighbour

I. INTRODUCTION

Nowadays People throughout the globe are increasingly using credit cards to make purchases, as they believe in being cashless and relying only on the internet for their transactions. credit card has made online transactions more convenient and accessible. Criminal usage of credit cards results in enormous monetary losses every year. There are an infinite number of ways to commit fraud, and it's been around since the dawn of time. According

to the 2017 PwC global economic crime study, around 48% of firms have been the victim of economic crime [1]. As a result, credit card fraud detection is an issue that must be addressed. In addition, the development of new technology opens up new avenues for scammers. Credit cards are widely accepted in contemporary culture, and as a result, the number of cases of credit card fraud has steadily risen in recent years.

Fraud rates tend to rise when credit cards become the most common method of payment for both online and brick-and-mortar purchases. The emergence of big data has rendered manual techniques of detecting fraudulent transactions impracticable since they are time consuming and unreliable[3]. Financial institutions, on the other hand, have resorted to more sophisticated methods. CI-based approaches make up the majority of these clever fraud methods. Unsupervised and supervised statistical fraud detection systems have been split into two major categories: To identify new transactions as either fraudulent or genuine, models based on samples of fraudulent and valid transactions are used in supervised fraud detection techniques.

II. EXISTING SYSTEM

Credit card fraud has emerged as major problem in the electronic payment sector. In this survey, we study data-driven credit card fraud detection particularities and several Deep learning methods to address each of its intricate challenges with the goal to identify fraudulent transactions that have been issued illegitimately on behalf of the rightful cardowner[3]. In particular, we first characterize a typical credit card detection task: the dataset and its attributes, the metric choice along with some methods to handle such unbalanced datasets. These questions are the entry point of every credit card fraud detection problem.

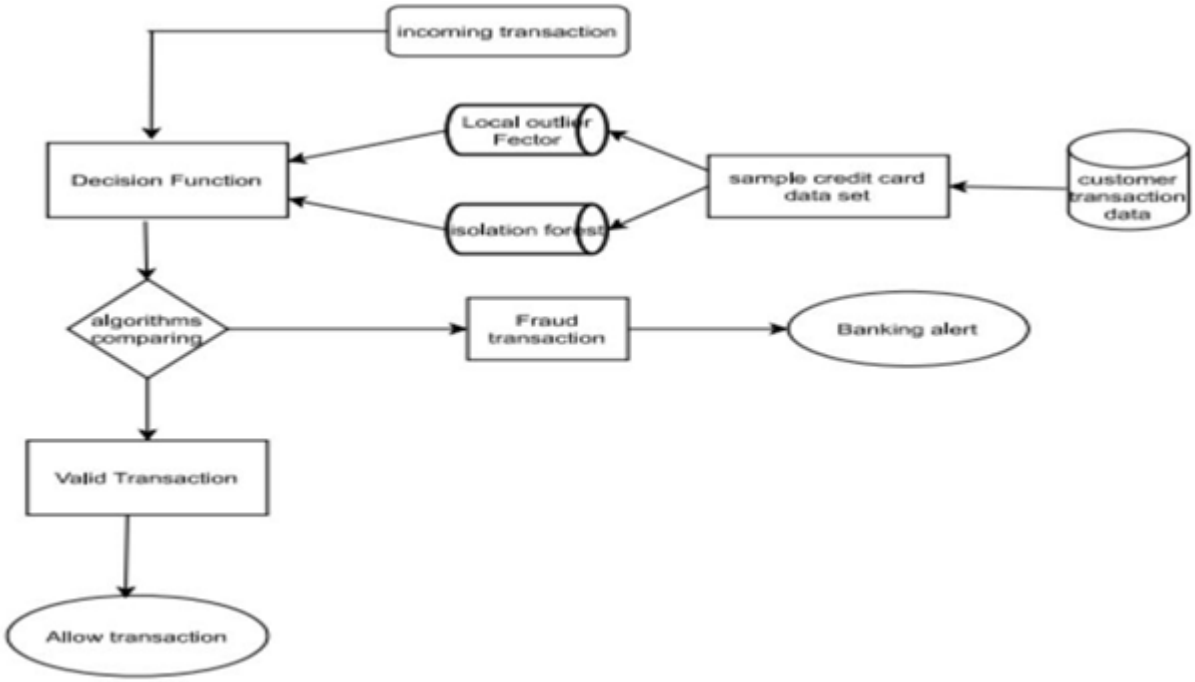
Then we focus on dataset shift (sometimes called concept drift), which refers to the fact that the underlying distribution generating the dataset evolves over times: For example, card holders may change their buying habits over seasons and fraudsters may adapt their strategies. This phenomenon may hinder the usage of Deep learning methods for real world datasets such as credit card transactions datasets[4]. Afterwards we highlight different approaches used in order to capture the sequential properties of credit card transactions. These approaches range from feature engineering techniques (transactions aggregations for example) to proper sequence modelling methods such as recurrent neural networks Long short Term memory(LSRM)) or graphical models (hidden mark ov models).

III. PROPOSED SYSTEM

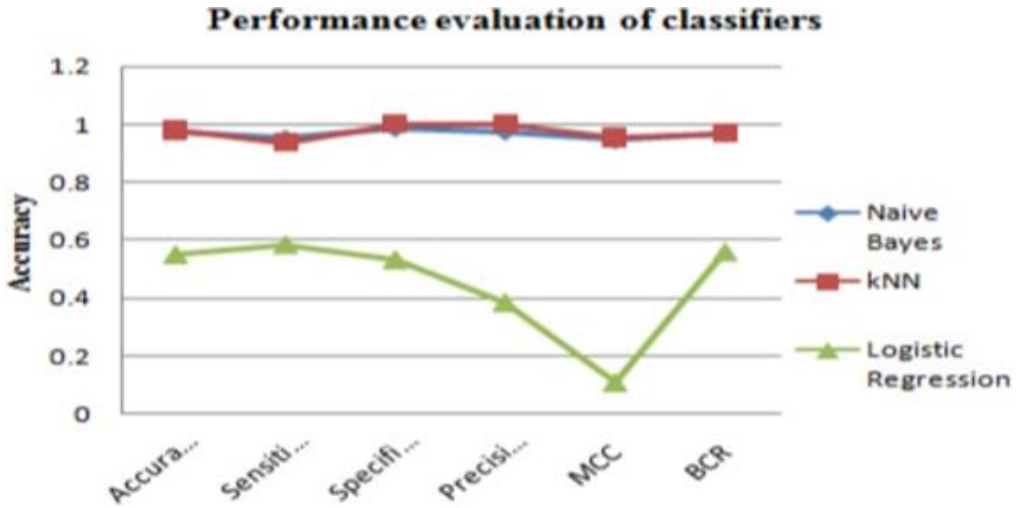
In this proposed project we designed a protocol or a model to detect the fraud activity in credit card transactions. This system is capable of providing most of the essential features required to detect fraudulent and legitimate transactions. As technology changes, it becomes difficult to track the modelling and pattern of fraudulent transactions. With the rise of Deep 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 [9]. We propose a Deep learning model to detect fraudulent credit card activities in online financial transactions. Analysing fake transactions manually is impracticable due to vast amounts of data and its complexity. However, adequately given informative features, could make it is

possible using Deep learning. This hypothesis will be explored in the project. To classify fraudulent and legitimate credit card transaction by supervised learning Algorithm such as Random Forest. To help us to get awareness about the fraudulent and without loss of any financially.

In the proposed we used CNN algorithm to detect the correct accuracy and prediction in existing we used SVM algorithm so that we have three drawbacks we cannot detect the correct fraud and non-fraud using the date set and cannot accessible correct prediction and the accuracy so we use CNN algorithm to detect 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. The correct accuracy of a dataset



IV. RESULT



Performance evaluation chart for Naïve bayes, kNN andLogistic Regression

Figure 1 shows the performance of k-NN algorithms with five training sets. When training sets 1 and 2 are used, the classifier performs best. However, k-NN performance is more precise when training set 2 is used instead of training set 1.

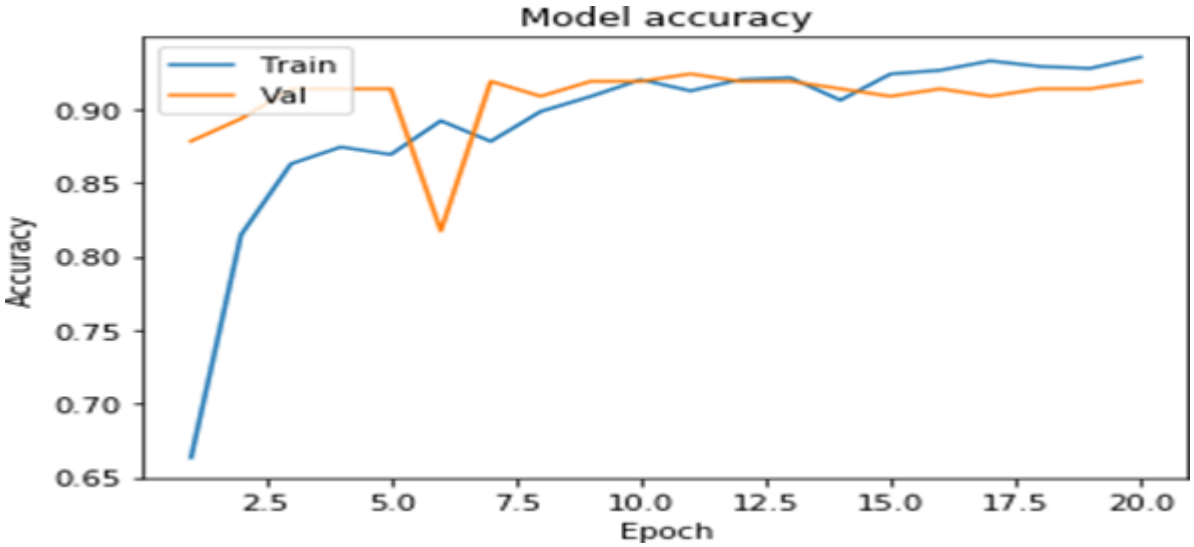


Figure 2shows the performance of the Nave Bayes classifier using the same training data. When utilizing training set 2, Nave Bayes performs best. The greatest properly categorized instance and precision, and the lowest mistakenly classified occurrence, demonstrate this.

V. CONCLUSION

The data set contains just 0.172 percent of fraudulent transactions, whereas the remainder of the transactions are legitimate. An oversampling resulted in 60% of fraudulent transactions and 40% of legitimate ones in the data set. The predictive model tends to be biased towards the majority samples when the input data is severely imbalanced. The upshot is that fraudulent transactions are often misrepresented as legitimate ones. Re sampling approaches, such as random under sampling, to mek-link elimination, random oversampling, Synthetic Minority Oversampling Technique (SMOTE), and a hybrid re sampling method, were used to solve this issue. To address the issue of class imbalance, we used algorithmic techniques like bagging and boosting. We used the random forest model as a bagging approach and the CNN as a boosting method for this task. For comparison with the other models, we used a logistic regression model in addition to these two. All three models were then examined using resampling techniques and without resampling methods. The comparative findings showed that the random forest in conjunction with a hybrid resampling strategy of SMOTE and link removal worked better than other m-methods.

VI.REFERENCES

[1]. https://towardsdatascience.com/the-random-forestalgorithm-d457d499ffcd
[2]. https://www.xoriant.com/blog/productengineering/decision-trees-machine-learningalgorithm.html

[3]. Gupta, Shalini, and R. Johari." A New Framework for Credit Card Transactions Involving Mutual Authentication between Cardholder and Merchant."International conference on Communication Systems and Network TechnologiesIEEE,2021:22-26.

[4]. Y. Gmbh and K. G. Co, "Global online payment methods: the Full year 2020," Tech. Rep., 2020.

[5]. Bolton, Richard J., and J. H. David. "Unsupervised Profiling Methodsfor Fraud Detection." Proc Credit Scoring andCredit Control VII (2020): 5– 7.

[6]. Drummond, C., and Holte, R. C. (2019). C4.5, class imbalance, and cost sensitivity: why under- sampling beatsoversampling. Proc of the ICML Workshop on Learning from Imbalanced Datasets II, 1–8.

[7]. Quah, J. T. S., and Sriganesh, M. (2020). Real-time credit card fraud detection using computational intelligence. ExpertSystems with Applications, 35(4), 1721-1732.

[8]. S. Xuan, G. Liu, Z. Li, L. Zheng, S. Wang, and G. N. Surname, Random Forest for credit card fraud detection, IEEE 15th International Conference on Networking, Sensing and Control (ICNSC),2018.

[9]. Satvik Vats, Surya Kant Dubey, Naveen Kumar Pandey, A Tool for Effective Detection of Fraud in Credit Card System, published in International Journal of Communication Network Security ISSN: 2231 1882, Volume-2, Issue-1, 2013.

[10].Rinky D. Patel and Dheeraj Kumar Singh, Credit Card Fraud Detection & Prevention of Fraud Using Genetic Algorithm, published by International Journal of Soft Computing and Engineering (IJSCE) ISSN: 2231-2307, Volume-2, Issue-6, January 2013.