CREDIT CARD FRAUD DETECTION

USING MACHINE LEARING WITH PYTHON

**Abstract**

Credit Card Fraud can be defined as a case where a person uses someone

else’s credit card for personal reasons while the owner and the card-issuing authorities are unaware of the fact that the card is being used. Due to the rise and acceleration of E-Commerce, there has been a tremendous use of credit cards for online shopping which led to High amount of frauds related to credit cards. In the era of digitalization, the need to identify credit card frauds is necessary. Fraud detection involves monitoring and analyzing the behaviour of various users to estimate detect or avoid undesirable behaviour. To identify credit card fraud detection effectively, we need to understand the various technologies, algorithms and types involved in detecting credit card frauds.

The algorithm can differentiate transactions which are fraudulent or not. Find fraud, they need to passed dataset and knowledge of the fraudulent transaction. They analyze the dataset and classify all transactions. Fraud detection involves monitoring the activities of populations of users to estimate, perceive or avoid objectionable behaviour, which consist of fraud, intrusion, and defaulting. Machine learning algorithms are employed to analyses all the authorized transactions and report the suspicious ones. These reports are investigated by professionals who contact the cardholders to confirm if the transaction was genuine or fraudulent. The investigators provide feedback to the automated system which is used to train and update the algorithm to eventually improve the fraud-detection performance over time.

**ARCHITECTURE**

Train/Test loop

Feature Extraction

v

Model

Historical Training\Building

Data

Test Model

Predictions

Training set

Test set

Steaming Data

Topic

Stream

Deployed Model



Predictions

**Future Scope**

While we couldn’t reach out goal of 100% accuracy in fraud detection, we did end up creating a system that can, with enough time and data, get very close to that goal. As with any such project, there is some room for improvement here. The very nature of this project allows for multiple algorithms to be integrated together as modules and their results can be combined to increase the accuracy of the final result. This model can further be improved with the addition of more algorithms into it. However, the output of these algorithms needs to be in the same format as the others. Once that condition is satisfied, the modules are easy to add as done in the code. This provides a great degree of modularity and versatility to the project. More room for improvement can be found in the dataset. As demonstrated before, the precision of the algorithms increases when the size of dataset is increased. Hence, more data will surely make the model more accurate in detecting frauds and reduce the number of false positives.

However, this requires official support from the banks themselves.

# CONCLUSION

Credit card fraud is without a doubt an act of criminal dishonesty. This article has listed out the most common methods of fraud along with their detection methods and reviewed recent findings in this field. This paper has also explained in detail, how machine learning can be applied to get better results in fraud detection along with the algorithm, pseudocode, explanation its implementation and experimentation results.

While the algorithm does reach over 99.6% accuracy, its precision remains only at 28% when a tenth of the data set is taken into consideration. However, when the entire dataset is fed into the algorithm, the precision rises to 33%.

This high percentage of accuracy is to be expected due to the huge imbalance between the number of valid and number of genuine transactions.

Since the entire dataset consists of only two days transaction records, its only a fraction of data that can be made available if this project were to be used on a commercial scale. Being based on machine learning algorithms, the program will only increase its efficiency over time as more data is put into it.

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