Review on different mechanisms for detecting financial fraud using machine learning

Sandeep Shinde[1], Satish Kale[2]

Lecturer, Department of Information Technology, BVIT Navi Mumbai, Thane, India[1]

Lecturer, Department of Information Technology, BVIT Navi Mumbai, Thane, India[2]

Abstract: In finance sector online digital transactions are rapidly growing in world global market. Due to pandemic condition every part world uses the digital transaction to purchase daily used commodity. According the world payment report, digital transaction are drastically increase more than double after pandemic. As online transaction rapidly increases properly false and fraud transaction has been increased. According the survey report more than seventy percent of customer in India are confusion about digital transaction which is more percentage than last two years. In this paper we have addressing various machine learning approaches to detecting false or fraud transaction.

Keywords: Machine learning, Supervised learning, Unsupervised learning.

I. INTRODUCTION

In financial sector technology is a rapidly moving towards digital transaction. In financial sector technology is a rapidly moving towards digital transaction. Modern technology playing key role to providing easily access of financial services. Every finance institute rapidly increasing business and reach to its end user and fulfill its requirement using modern technology. The dark side of financial technology, due to online transaction false and fraud transaction significantly increasing. Every finance institute are adapting machine learning, deep learning which is subset of Artificial Intelligent technology use for improving their services. The Machine learning and deep learning are providing various approaches to detect the false and fraud transaction. In this paper we have addressing various machine learning and deep learning approaches to detecting false or fraud transaction.

A rule-based method

A rule-based system stores, organizes, and tries to control data using principles invented by humans. It imitates human intelligence in this way. Rule-based systems need to specify a set of facts or a data source, as well as a principles for altering that data, to function. Because they tend to follow the line of 'IF X happens THEN do Y,' these rules are commonly referred to as 'If statements. It is very important identify fraudulent financial transaction using some important indicator. High volume transaction or those having unusual activity transaction are required next level verification. Rigorously rule-based method are based on algorithms created by fraud analysts to execute multiple fraud detection cases. Earlier system are used about more than three hundred rules to need to validate a transaction today.

ML-based Fraud Detection Algorithms

The algorithms in the rule-based method are unable to detect hidden patterns. They cannot forecast fraud by going above the restrictions because they are founded on stringent regulation. However, in the real world, proficient user are very experienced and can develop innovative ways to do the crimes at any time. As a result, a system that can evaluate data patterns and forecast and respond to novel circumstances for which it has not been taught or explicitly programmed is essential. As a result, we adopt Machine Learning to identifying fraud. A machine strives to learn on its own and grows through experience. Because of its speedy computing, this is also an effective technique of identifying fraud. It doesn't even necessitate the help of a fraud analyst.

Supervised learning

The supervised learning methods through which find the connection between given data and output data by conducting various experiment on available data. Using these method useful to make train classification models based on past data available before modifying new data. Supervised learning analyses the historical information based on the result made a labelling as good or bad. Predicative data analysis method is used by supervised learning model and quality of result is totally depend

Un-Supervised learning

Whenever there is little or no transaction data, an unsupervised learning technique is used to predict unusual behavior. Unsupervised learning methods process and analyses fresh data on a continuous basis, then update their models based on the findings. It learns to identify patterns and determine whether they are related with legal or fraudulent operations. Unsupervised learning techniques are frequently used in fraud detection.

Naive Bayes classifiers

Naive Bayes classifiers are a type of simple probabilistic classifiers based on the Bayes theorem and strong (naive) independence assumptions between inputs in machine learning. Models that assign broadly categorized to issue events, expressed as vectors of feature values, using the Naive Bayes technique. It is a family of techniques for training such classifiers, all based on the same principle: all naive Bayes classifiers assume that the value of one feature is independent of the value of any other feature, given the class variable. Principle: all naive Bayes classifiers assume that the value of one feature is independent of the value of any other feature, given the class variable.

Logistic Regression models

The technique of modelling the probability of a discrete result given an input variable is known as logistic regression. The most frequent logistic regression models have a binary outcome, which might be true or false, yes or no, and so forth.

K-Nearest Neighbors:

A K-nearest Neighbors (KNN) classifier appears to be a basic, easy-to-implement supervised machine learning technique that might be utilized to solve classification and regression problems. Given their current distances to points in a learning set, the K Nearest Neighbors approach seeks to categories query points whose class is unknown (i.e. whose class is known a priori). It is a commonly used supervised machine learning tool that often included both a regression and classification method.

CONCLUSION

Fraud detection research has been going on for almost two decades, and it has used a number of different methods, from manual verification to consumer end authentication. In this field, machine learning models have also had a lot of success. This paper presents a study addressing multiple machine learning models for the detection of fraudulent transactions on diverse data sets. The type of problem, dataset size, resources, and other factors all influence which machine learning method to use. Using many models to expedite evaluation and improve accuracy is a smart practice.

REFERENCES:

[1.] Naresh Kumar Trivedi, Sarita Simaiya,Umesh Kumar Lilhore, Sanjeev Kumar Sharma. 2020 January. An efficient credit card Fraud Detection Model Based on Machine learning methods. In International Journal of Advanced Science and Technology. Vol. 29, No. 5, (2020). pp. 3414-3424

[2.] Mykhailo Granik, Volodymyr Mesyura. Fake News Detection Using Naive Bayes Classifier. 2017 in 7 IEEE First Ukraine Conference on Electrical and Computer Engineering (UKRCON) Matar Al Marri, Ahmad AlAli, 2020 May, Financial Fraud Detection using Machine Learning Techniques. In Rochester Institute of Technology.

[3.] Adrian C B Gepp, June 2015. Financial statement fraud detection using supervised learning methods. In Business, Bond University.

[4.] Pradheepan Raghavan, Neamat El Gayar. Fraud Detection using Machine Learning and Deep Learning. December 2019. In International Conference on Computational Intelligence and Knowledge Economy.

[5.] Branka Stojanovic, Josip Bozic,Katharina Hofer-Schmitz,Kai Nahrgang, Andreas Weber, Atta Badii, Maheshkumar Sundaram ,Elliot Jordan and Joel Runevic. 2021. Follow the Trail: Machine Learning for Fraud Detection in Fintech Applications. Sensors (Basel). DOI: 10.3390/s21051594

[6.] Awoyemi, J.O., Adetunmbi, A.O. and Oluwadare, S.A., 2017, October. Credit card fraud detection using machine learning techniques: A co parative analysis. In 2017 International Conference on Computing Networking and Informatics (ICCNI) (pp. 1-9). IEEE

[7.] Popat, R.R. and Chaudhary, J., 2018, May. A survey on credit card fraud detection using machine learning. In 2018 2nd International Conference on Trends in Electronics and Informatics (ICOEI) (pp. 1120-1125). IEEE

[8.] Thakor, A.V. Fintech and banking: What do we know? J. Financ. Intermed. 2020, 41

[9.] E. Ngai et.al., The Application of Data Mining Techniques in Financial Fraud Detection: A Classification Framework and an Academic Review of Literature, Decision Support Systems. 50, 2011, 559–569

[10.] Dhankhad, S., Mohammed, E. and Far, B., 2018, July. Supervised machine learning algorithms for credit card fraudulent transaction detection: a comparative study. In 2018 IEEE International Conference on Information Reuse and Integration (IRI) (pp. 122-125). IEEE.