Review of: "Predicting Mobile Money Transaction Fraud using Machine Learning Algorithms"

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Potential competing interests: No potential competing interests to declare.

Comments to author:

Review report on: " Predicting Mobile Money Transaction Fraud using Machine Learning Algorithms "

The paper addresses an issue that has been extensively studied in recent years. My comments are as follows:

1) In the **introduction** (Page 2 – Lines 9-11), the author wrote: *"This paper aims to use ML learning algorithms to build a fraud detection model that will detect red flags of fraud and money laundering from mobile money transactions. More specifically, this paper will use a set of risk-based indicators to predict how likely a transaction will be fraudulent"*. **Section 4.2.** (Page 14 – Lines 3-5): *"In this study, we sought to compare the performances of several different classifiers to determine which would be best suited for predicting financial transaction fraud. Logistic regression was used as the base model, then compared with the results of other classifiers*". After having analysed his data using four classifiers (Logistic Regression, Decision Tree, Gradient Descent and Random Forest), the author concluded (Page 19, Lines 4-6): "*While all the classifiers were very useful in predicting suspicion transactions, the **random forest model** was the most consistent and best-performing model across all the classifiers*".

In a related work carried out by **Kumar and Nalini (2021)**, the main objective is: *"to detect the frauds in mobile money transactions using logistic regression and random forest algorithms and comparing their accuracy*". The conclusion this study is: "*the accuracy of detecting frauds in mobile money transactions was done by **random forest algorithm** with better accuracy 99.6% as compared to logistic regression algorithm with accuracy 92.6%*".

A similar paper is written by **Botchey, Qin, and Hughes-Lartey (2022)**. The paper is focused on an evaluation analysis of 4 classification algorithms in predicting fraud in mobile money transactions (Random Forest, XGBoost, Artificial Neural Network and Anomaly Detection). The conclusion of this paper is: "*Overall, **Random Forest** was considered to be a better classifier for predicting fraud in mobile money transactions with regards to the other 3 classifiers in all the other 3 evaluations. Anomaly Detection apart from its good performance in model accuracy did poorly in the other 3.*"

My concern: As similar studies have already been conducted with almost similar results (See Kumar and Nalini, 2021;

Botchey, Qin, and Hughes-Lartey, 2020; Botchey, Qin, and Hughes-Lartey, 2022 …..); What have these studies ignored and the author is trying to highlight in this study? I think the research problem needs to be revised.

2) Pages 2-7: (The literature review section): Few related papers are cited. You should review the related papers that addressed the issue of fraud in financial transactions and that focused their analysis on the comparison of different types of machine learning algorithms (maybe different from those you used). As I stated earlier, many authors have studied the issue of fraud prediction in financial transactions (credit card fraud, online transactions fraud etc.). You should summarize various related works (objective, methodology and results) in this section.
It is not appropriate to present the different algorithms in the section devoted to the literature review. The author should insert a methodology section in which the algorithms and data can be presented.

3) The author may take a look at some related papers including the followings:

a) Lakshmi S V S S, Selvani Deepthi Kavila. 2018. Machine Learning For Credit Card Fraud Detection System, *International Journal of Applied Engineering Research*, 13 (24), pp. 16819-16824.
b) L. Bhavya, V. Sasidhar Reddy, U. Anjali Mohan, S. Karishma. 2020. Credit Card Fraud Detection using Classification, Unsupervised, Neural Networks Models, *International Journal of Engineering Research & Technology*(IJERT), 9(4), http://www.ijert.org
c) Bocheng Liu, Xiang Chen and Kaizhi Yu. 2021. Online Transaction Fraud Detection System Based on Machine Learning, *Journal of Physics: Conference Series*, doi:10.1088/1742-6596/2023/1/012054
d) Jiaxin Gao, Zirui Zhou, Jiangshan Ai, Bingxin Xia, Stephen Coggeshall. 2019. Predicting Credit Card Transaction Fraud Using Machine Learning Algorithms, *Journal of Intelligent Learning Systems and Applications*, 11, 33-63. http://www.scirp.org/journal/jilsa
e) Mosa M. M. Megdad, Bassem S. Abu-Nasser and Samy S. Abu-Naser. 2022. Fraudulent Financial Transactions Detection Using Machine Learning, *International Journal of Academic Information Systems Research*(IJAISR), 6(3), pp. 30-39.
f) Dahee Choi and Kyungho Lee. 2017. Machine Learning based Approach to Financial Fraud Detection Process in Mobile Payment System, *IT CoNvergence PRActice* (INPRA), 5(4), pp. 12-24.
g) Francis E. Botchey, Zhen Qin, Kwesi Hughes-Lartey and Kwame. E. Ampomah. 2021. Predicting Fraud in Mobile Money Transactions using Machine Learning: The Effects of Sampling Techniques on the Imbalanced Dataset, *Informatica 45* (2021) 45–56, https://doi.org/10.31449/inf.v45i7.3179
h) G. Manoj Kumar, M. Nalini. 2021. Accuracy Analysis for Logistic Regression Algorithm and Random Forest Algorithm to Detect Frauds in Mobile Money Transaction, *Revista Gestão Inovação e Tecnologias*, 11(4):1228-1240
i) Francis E. Botchey, Zhen Qin and Kwesi Hughes-Lartey. 2022. An Evaluation of Machine Learning Methods to Predict Fraud in Mobile Money Transactions, International Journal of Engineering Research & Technology (IJERT), 11(1), pp. 573-580. http://www.ijert.org.