

## Efficient Credit Card Fraud Detection Based on Multiple ML Algorithms

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**Abstract :** In the contemporary digital era, the rise of credit card fraud poses a significant threat to both financial institutions and consumers. As fraudulent activities become more sophisticated, there is an escalating demand for robust and effective fraud detection mechanisms. Advanced machine learning algorithms have become crucial tools in addressing this challenge. This paper conducts a thorough examination of the design and evaluation of a credit card fraud detection system, utilizing four prominent machine learning algorithms: random forest, logistic regression, decision tree, and XGBoost. The surge in digital transactions has opened avenues for fraudsters to exploit vulnerabilities within payment systems. Consequently, there is an urgent need for proactive and adaptable fraud detection systems. This study addresses this imperative by exploring the efficacy of machine learning algorithms in identifying fraudulent credit card transactions. The selection of random forest, logistic regression, decision tree, and XGBoost for scrutiny in this study is based on their documented effectiveness in diverse domains, particularly in credit card fraud detection. These algorithms are renowned for their capability to model intricate patterns and provide accurate predictions. Each algorithm is implemented and evaluated for its performance in a controlled environment, utilizing a diverse dataset comprising both genuine and fraudulent credit card transactions.

**Keywords :** efficient credit card fraud detection, random forest, logistic regression, XGBoost, decision tree

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