ONLINE PAYMENT FRAUD DETECTION

 Abstract

The rapid growth of online transactions has led to a surge in fraudulent activities, underscoring the critical need for advanced fraud detection systems. Traditional methods often face challenges such as class imbalance and model overfitting, limiting their accuracy and reliability. This project leverages machine learning techniques to enhance fraud detection by addressing these issues through effective data preprocessing and the application of robust classification algorithms. Among the models tested, XGBoost demonstrated exceptional performance, achieving a testing accuracy of 99.51%, highlighting its efficacy in identifying fraudulent transactions while maintaining strong generalization. Unlike conventional approaches, this project emphasizes dataset balancing and model adaptability to unseen data, significantly reducing overfitting risks. Future work will focus on extending this framework to real-time fraud detection systems and adaptive learning mechanisms to dynamically counter emerging fraud patterns. The proposed solution offers a scalable and reliable approach to securing online financial transactions, paving the way for safer digital payment ecosystems

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