

عنوان مقاله:

Performance Evaluation of Machine Learning Algorithms on Raw, Undersampled and Oversampled Data for Credit Card Fraud Detection

محل انتشار:

دومین کنفرانس برق، مکانیک، هوافضا، کامپیوتر و علوم مهندسی (سال: 1402)

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خلاصه مقاله:

Credit card fraud poses a significant threat to individuals, financial institutions, and small e-commerce businesses. This paper compares machine learning algorithms for detecting fraudulent credit card transactions. Using Kaggle's Credit Card Fraud Detection dataset, which contains one million transactions with eight features, the study addresses the class imbalance through preprocessing and undersampling/oversampling techniques. Logistic Regression, Decision Tree, XGBoost, and Random Forest algorithms are trained and evaluated on raw, undersampled, and oversampled data using SMOTE for oversampling. Results consistently show that models trained on oversampled data with SMOTE outperform others, with Random Forest achieving the highest precision, recall, and F1 score. These findings emphasize the importance of data preprocessing and oversampling methods like SMOTE in enhancing fraud detection models. The study provides valuable insights for robust fraud detection systems, ensuring financial security and preserving electronic payment integrity. It highlights the significance of considering metrics beyond accuracy and identifies Random Forest as the most effective algorithm for credit card fraud detection. These findings guide algorithm selection and demonstrate the effectiveness of machine learning against evolving fraud tactics.

کلمات کلیدی:

credit card fraud, fraud detection, machine learning

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