

Credit Card Fraud Detection Using Machine Learning and Data Visualization

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Abstract: Credit card fraud has become a major challenge for financial institutions due to the exponential growth of online transactions and digital payment systems. Detecting fraudulent activity in real-time is crucial for preventing financial loss and ensuring customer trust. This review paper explores various machine learning techniques and visualization methodologies for credit card fraud detection. It discusses the datasets, preprocessing techniques, algorithms such as Logistic Regression, Random Forest, Decision Trees, and Neural Networks, and compares their performance. Additionally, the paper highlights the integration of a visualization dashboard developed using Flask and Plotly for real-time fraud monitoring and analytics. The paper concludes with current challenges, trends, and future research opportunities in fraud detection using artificial intelligence.

Keywords: Credit Card Fraud Detection, Machine Learning, Data Visualization, Flask, Python, Random Forest, Logistic Regression, Anomaly Detection, Real-time Monitoring, Data Analytics.

