Forecasting Credit Card Users' Credibility Using Machine Learning

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Abstract

This study aims to develop a Machine Learning-based model to predict the credibility of credit card users, with the goal of improving the accuracy and reliability of credit ratings in the banking industry. By leveraging Machine Learning algorithms, this research seeks to enhance the accuracy of credit ratings, enabling banks to make more informed decisions about credit expansion and risk management. The study used a dataset of credit card user characteristics and payment histories, obtained from a publicly available dataset and a reliable source known for its comprehensive and representative data on credit card users in Germany. Different Machine Learning algorithms, namely standard neural networks and deep neural networks, have been used to predict the trustworthiness of credit card users. Techniques such as SMOTE, SVM-SMOTE, Borderline-SMOTE, and SMOTE-ENN were used to address class imbalance in the dataset. Models were evaluated based on metrics such as accuracy, sensitivity, and specificity. The results indicated that deep neural network models generally outperformed standard neural network models. The importance of the study lies in its ability to address limitations in current credit scoring methods and improve the overall effectiveness of credit risk management practices in banking. Specifically, deep neural network models balanced by SMOTE-ENN showed the highest levels of accuracy.

Overall, the results indicate that using deep neural network models on balanced datasets can effectively predict the trustworthiness of credit card users. Future research

can focus on improving model performance further by incorporating advanced Deep Learning architectures, ensemble learning techniques, and feature engineering strategies.