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AI Bankruptcy Prediction for Unbalanced Datasets

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The challenge of constructing efficient classification models while dealing with imbalanced datasets is presented by bankruptcy prediction, which is widely considered to be one of the most intensively researched areas of finance. Moreover, the high dimensionality of the data results in a degradation in interpretability and additional costs associated with the acquisition of firm data. The majority of studies have tackled the issue of imbalanced datasets by employing re-sampling techniques, which means they have utilized these techniques independently from the classification model. For the purpose of class-imbalanced bankruptcy prediction scenarios, we present an integrated model that extends XGBoost. In addition, multi-objective evolutionary feature selection is utilized in order to decrease both the size of the subsets and the cost of misclassification. This is done to discover the subset of features that are significant. The suggested model is validated by using three datasets that are imbalanced and concern companies from the United States of America, Poland, and Taiwan. According to the findings that were published here, the combined Imbalance-XGBoost model performs better than other re-sampling-based ensemble learning approaches that are currently in use. Additionally, the findings of this research demonstrate how multi-objective evolutionary feature selection has the potential to significantly cut down on the expenses associated with the bankruptcy model.

Keywords: artificial intelligence, bankruptcy, prediction, multi-objective, XGBoost