Contribution ID: **56** Type: **not specified**

Cost-Sensitive Classifiers for Fraud Detection

Tuesday, 12 September 2023 18:10 (20 minutes)

Financial fraud detection is a classification problem where each operation have a different misclassification cost depending on its amount. Thus, it fall within the scope of instance-dependent cost-sensitive classification problems. When modeling the problem with a parametric model, as a logistic regression, using a loss function incorporating the costs has proven to result in a more effective parameter estimation compared to classical approaches, which only rely on the likelihood maximization. The drawback is that this has only been empirically demonstrated in a limited number of datasets, thus resulting in a lack of support for their generalized application. This work has two aims. The first is to propose cost-sensitive parameter estimators and develop its consistency properties and asymptotic distribution under general conditions. The second aim is to test the cost-sensitive strategy over a wide range of simulations and scenarios, testing the improvement obtained with the proposed cost-sensitive estimators compared to a cost-insensitive approach.

Keywords

Cost-sensitive classification, fraud detection, credit risk

Classification

Both methodology and application

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Session Classification: CONTRIBUTED Finance

Track Classification: Finance