A hybrid mining model based on Artificial Neural Networks, Support Vector Machine and Bayesian for credit scoring

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Abstract

In recent years, credit scoring is becoming one of the most important topics in the financial field. In consumer credit markets, lending decisions are usually represented as a set of classification problems. In this Paper, we have proposed a hybrid mining model for credit scoring, based on Artificial Neural Networks, Support Vector Machine and Naïve Bayesian to improve the accuracy of credit scoring classification task. To make these basic classifiers as an ensemble model, we have used majority voting technique to improve the prediction accuracy of existing credit scoring models. In order to approve the capability of our model in the field of credit scoring, Australian credit real dataset of UCI machine learning database repository has been applied. Finally we conduct a comparative assessment for the performance measuring of these methods, with three basic learners (Artificial Neural Networks, Support Vector Machine and Naïve Bayesian). Our findings lead us to believe that this hybrid method may provide better performance in the field of credit scoring.

Key words: Credit Scoring, Data Mining, Classifier ensemble, Support Vector Machine, Descion Tree, Naïve Bayesian

1. Introduction

Appearance of economical crisis in recent decade caused the banks and credit institutes to have more attention to credit risk (Wang et al 2011). So banks to reduce their credit risk used various kinds of credit scoring systems, therefore these systems developed and applied to support credit decisions (Hsieh and Hung 2010) Credit scoring is used to classify the applicants into two types: applicants with good and bad credit. Applicants with good credit have great possibility to repay financial obligation, and Applicants with bad credit have high possibility of defaulting(Wang et al 2011).