

A hybrid evaluation metric for optimizing classifier

ABSTRACT

The accuracy metric has been widely used for discriminating and selecting an optimal solution in constructing an optimized classifier. However, the use of accuracy metric leads the searching process to the sub-optimal solutions due to its limited capability of discriminating values. In this study, we propose a hybrid evaluation metric, which combines the accuracy metric with the precision and recall metrics. We call this new performance metric as Optimized Accuracy with Recall-Precision (OARP). This paper demonstrates that the OARP metric is more discriminating than the accuracy metric using two counter-examples. To verify this advantage, we conduct an empirical verification using a statistical discriminative analysis to prove that the OARP is statistically more discriminating than the accuracy metric. We also empirically demonstrate that a naive stochastic classification algorithm trained with the OARP metric is able to obtain better predictive results than the one trained with the conventional accuracy metric. The experiments have proved that the OARP metric is a better evaluator and optimizer in the constructing of optimized classifier.

Keyword: Hybrid evaluation metric; Accuracy metric; Precision metric; Recall metric; Classifier optimization