International Journal of Innovative
Computing, Information and Control
Volume **7**, Number **12**, December **2011**

 ISSN 1349-4198
pp. 6815–6826

HYBRID ASSOCIATIVE CLASSIFICATION ALGORITHM USING ANT COLONY OPTIMIZATION

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Received March 2010; revised July 2010

Abstract. *Classification rule discovery and association rules mining are two important data mining tasks. Association rules mining discovers all those rules from the training set that satisfies minimum support and confidence threshold while classification rule mining discovers a set of rules for predicting the class of unseen data. In this paper, we proposed a hybrid classification algorithm called ACO-AC, combining the idea of association rules mining and supervised classification using ant colony optimization. It is a class based association rules mining. The proposed technique integrates the classification with the association rule mining to discover high quality rules for improving the performance of classifier. Ant colony optimization is used to mine only the more appropriate subset of class association rules instead of exhaustively searching for all possible rules. First, strong association rules are discovered based on confidence and support and then, these rules are used to classify the unseen data. In proposed approach, we can mine association rules of each class parallel in distributed manner. We compared the proposed approach with eight other state of the art classification algorithms on twenty six data sets. Experiments results show that the hybrid classifier is more accurate and achieves higher accuracy rates when compared with other classification techniques.*

Keywords: Classification, Association rules mining, Ant colony optimization, Associative classification

1. **Introduction.** Almost all organizations collect a large number of data. There is potential business intelligence hidden in this data. The data mining has attracted a great deal of attention due to the wide availability of this huge number of data. The major question is how to turn these data into useful information and knowledge. The field of data mining answers this question. There are different data mining tasks including supervised classification, association rules mining or market basket analysis, unsupervised clustering, web data mining and regression. One technique of the data mining is classification. The goal of the classification is to build a set of models on the training data that can correctly predict the class of test objects. The input of these models is a set of objects (training data) containing the classes in which these objects belong to a set of variables describing different characteristics of the objects. There are several problems from a wide range of domains which can be casted into classification problems [1].

The aim of association rules mining is to find out the strong association between items in a given data base. Association rules that predict only a class attribute are called class association rules. Associative classification takes advantage of association rules mining for finding interesting relationship among items in the data set.

Ant colonies are distributed systems, and in spite of the simplicity of their individuals, they present a highly structured social organization. As a result of this organization,