Abstract

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A Parallel Fuzzy-Genetic Algorithm for Classification and Prediction

One of the top challenging problems in data mining domain is the distributed data mining (DDM) and mining multiagent data. In distributed environment, classical techniques require that the distributed data be first collected in a data warehouse which is usually either ineffective infeasible. Hence, mining over decentralized data sources can overcome such issues. Rule-based classifiers involve sharp cutoffs for continuous attributes. Fuzzy Logic System (FLS) has features that make it an adequate tool for addressing this shortcoming effectively and efficiently. In this paper, a framework for a Parallel Fuzzy-Genetic Algorithm (PFGA) has been developed for classification and prediction over decentralized data sources. The model parameters are evolved using two nested genetic algorithms (GAs). The outer GA evolves the fuzzy sets whereas the inner GA evolves the fuzzy rules. During optimization, best rules are only distributed among agents to construct the overall optimized model. Several experiments have been conducted over many benchmark datasets. The experiment results show that the developed model has good accuracy and more efficient in performance and comprehensibility of linguistic rules compared to some models implemented in KEEL software tool.