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# A Fast Feature Weighting Algorithm of Data Gravitation Classification

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## Abstract

The data gravitation classification (DGC) model is a new classification method that has gained great research interest in recent years. Feature weights are the key parameters in DGC models, because the classification performances of these models are very sensitive to such feature weights. The available DGC models use wrapper-like algorithms to obtain their optimised feature weights. Although such algorithms produce high classification accuracies, but they contribute to the high computational complexities of the DGC models. In this study, we propose a fast feature weight algorithm for DGC models called FFW-DGC. We use the concepts of feature discrimination and redundancy to measure the importance of a feature, after which two fuzzy subsets are constructed to respectively represent these concepts. Next, we combine the two fuzzy subsets to compute the feature weights used in gravitational computing. We conduct our experiments on 25 standard data sets and 22 imbalance data sets, and compare FFW-DGC with 11 kinds of classifiers, including the swarm-intelligence-based DGC (PSO-DGC) model. Competitive results of FFW-DGC demonstrate that it can obtain high classification accuracies, but also hundreds of times of speedup ratios compared with PSO-DGC.

*Keywords:*

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