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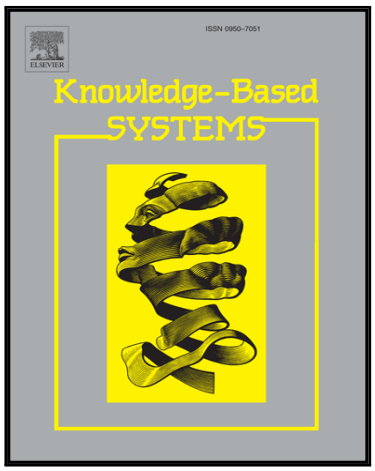

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A new general nearest neighbor classification based on the mutual neighborhood information

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Abstract

The nearest neighbor (NN) rule is effective for many applications in pattern classification, such as the famous *k*-nearest neighbor (kNN) classifier. However, NN-based classifiers perform a one-sided classification by finding the nearest neighbors simply according to the neighborhood of the testing sample. In this paper, we propose a new selection method of nearest neighbors based on a two-sided mode, called general nearest neighbor (GNN) rule. The mutual neighborhood information of both testing sample and training sample is considered, then the overlapping of the above neighborhoods is used to decide the general nearest neighbors of the testing sample. To verify the effectiveness of the GNN rule in pattern classification, a *k*-general nearest neighbor (kGNN) classifier is proposed by applying the *k*-neighborhood information of each sample to find the general nearest neighbors. Extensive experiments on twenty real-world datasets from UCI and KEEL repository

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