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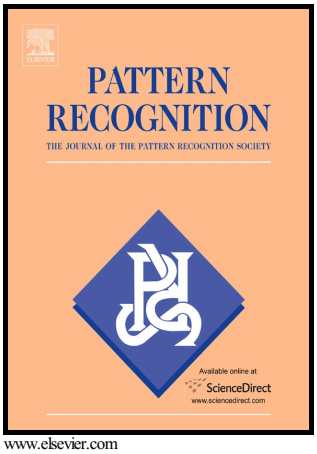

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Kernel-based hard clustering methods with kernelization of the metric and automatic weighting of the variables

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Abstract

This paper presents kernel-based hard clustering methods with kernelization of the metric and automatic weighting of the variables. The proposed methodology is supported by the fact that a kernel function can be written as a sum of kernels evaluated separately on each variable. Thus, in the proposed algorithms dissimilarity measures are obtained as sums of Euclidean distances between patterns and centroids computed individually for each variable by means of kernels. The main advantage of this approach over the conventional approach is that it allows the use of kernelized adaptive distances, which are suitable to learn the weights of the variables dynamically, improving the performance of the algorithms. Moreover, various partition and cluster interpretation tools are introduced. Experiments with a number of benchmark datasets corroborate the usefulness of the proposed algorithms and the merit of the partition and cluster interpretation tools.

Keywords: Kernel clustering, Kernelization of the Metric, Weighting of the variables, Adaptive distances.

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