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Improving the Fuzzy Min-Max neural network with a K-nearest hyperbox expansion rule for pattern classification

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ABSTRACT

An improved Fuzzy Min-Max (FMM) neural network with a *K*-nearest hyperbox expansion rule is proposed in this paper. The aim is to reduce the FMM network complexity for undertaking pattern classification tasks. In the proposed model, a useful modification to overcome a number of identified limitations of the original FMM network and to improve its classification performance is derived. In particular, the *K*-nearest hyperbox expansion rule is formulated to reduce the network complexity by avoiding the creation of too many small hyperboxes within the vicinity of the winning hyperbox during the FMM learning stage. The effectiveness of the proposed model is evaluated using a number of benchmark data sets. The results compare favorably with those from various FMM variants and other existing classifiers.

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