Abstract

In data mining two important tasks involved are classification and clustering. In general, in classification the classifier assigns a class label from a set of predefined classes to a new input object. In the context of machine learning, classification is supervised learning. There are different approaches used for classification. Originally, Simpson proposed the fuzzy min-max (FMM) neural network [2] for classification, in which the classes are represented as an aggregation of fuzzy set hyperboxes in the n-dimensional pattern space. In the recent past, many variants of original FMM neural network have been proposed for classification and clustering. This paper proposes novel modified FMM (MFMM) neural network training algorithm
by suggesting significant modifications in the original FMM neural network learning. Similarly to the original algorithm, the hyperbox fuzzy sets are used for a representation of classes. Unlike other variants, more importantly the proposed modifications resulted in single pass training. Moreover, like other variants, the proposed learning is quick, efficient and capable of constructing nonlinear decision boundaries. All these benefits make it suitable for difficult real world problems involving classification. A detailed description of the MFMM neural network topology, its learning algorithm and comparison with other recent FMM variants by evaluating the efficacy of MFMM using benchmark Fisher Iris Data set is given.

References

Modified Fuzzy Min-Max Neural Network for Pattern Classification

- Blake, C. Keogh, E. and Merz, C. J. 1998. UCI repository of machine learning
Modified Fuzzy Min-Max Neural Network for Pattern Classification


Index Terms

Computer Science

Fuzzy Systems

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Classification; Clustering; Fuzzy Min-max Neural Network