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IJCA Proceedings on International Conference
on Internet of Things, Next Generation Networks and Cloud Computing

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ICINC 2016 - Number 1

Year of Publication: 2016

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{bibtex}icinc4768.bib{/bibtex}

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.

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Computer Science

Index Terms

Fuzzy Systems

Keywords

Classification; Clustering; Fuzzy Min-max Neural Network