

数据库、信息处理

## 一种新的模糊支持向量机

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**摘要** 基于类中心设计隶属度函数的模糊支持向量机有效地解决支持向量机对噪声或孤立点敏感度高的问题, 但是, 由于它对支持向量赋予较小的隶属度, 从而降低了其分类作用。基于此, 提出一种新的隶属度函数设计方法; 同时, 针对模糊支持向量机普遍存在因核函数计算量大, 而导致训练时间长的问题, 通过使用一种高效的截集模糊C-均值聚类方法对训练样本进行聚类, 然后以聚类中心作为样本进行训练, 以减少训练样本来提高训练速度。根据上述新的隶属度函数设计方法和截集模糊C-均值聚类方法, 构建了一种基于截集模糊C-均值聚类并改进了隶属度函数的模糊支持向量机, 数值试验表明这种新的模糊支持向量机有效地提高了训练速度和分类精度。

**关键词** [模糊支持向量机](#) [隶属度函数](#) [截集模糊C-均值聚类](#)

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## New fuzzy support vector machine

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### Abstract

Fuzzy Support Vector Machine (FSVM), which are the design methods of membership functions are based on class-center, and can effectively overcome the problem that the Support Vector Machine (SVM) is sensitive to the noises and outliers; however, it assigns smaller memberships to the support vectors, which may decrease the effects of these support vectors to the construction of the classification hyperplane. To tackle the above problem, a novel method to determine membership function is proposed. At the same time, the training time of FSVM is generally long which is aroused by the high computational complexity of constructing its kernel function. To reduce the training time of FSVM, the training samples are clustered by an effective sectional set fuzzy C-means clustering (S2FCM) firstly. Then, the cluster centers are taken as training samples. According to the novel method to determine membership function and the S2FCM, a new FSVM is constructed. Experimental results show that the new FSVM can effectively enhance the training speed and classification accuracy rate.

**Key words** [fuzzy support vector machine](#) [membership function](#) [sectional set fuzzy C-means clustering](#)

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