RADIAL BASIS FUNCTION NETWORKS WITH ADJUSTABLE KERNEL SHAPE PARAMETERS

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Abstract

Radial basis function network (RBFN) which is commonly used in the classification problems has two parameters, a kernel center and a radius that can be determined by unsupervised or supervised learning. However, it has a disadvantage that it considers that all the independent variables have the equal weights. Thus the contour lines of the kernel function are circular, but in fact, the influence of each independent variable on the model is so different that more reasonable contour lines should be oval. To overcome this disadvantage, this paper presents an adaptive radial basis function network (ARBFN) with kernel shape parameters and derives the learning rules from supervised learning. The results show that ARBFN is much more accurate than the traditional RBFN, reflecting that the shape parameter can really improve the accuracy of RBFN.

Keyword：Radial basis function network, supervised learning, kernel function, classification

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