自適應機率神經網路

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摘要

This study proposes adaptive probabilistic neural networks (APNN), which include three kinds of parameters: the variable weights representing the importance of input variables, the core-width-reciprocal representing the effective range of patterns, and the data weights representing the reliability of patterns. This study proposes an algorithm to adapt these parameters, and maximize the accuracy of the model by optimizing these parameters in the learning process. In order to prove the performance of APNN, three artificial function mapping problems as well as an actual classification problem are employed to test it and compare it with a back-propagation network (BPN) and a probabilistic neural network (PNN). The results proved that the accuracy of APNN is only slightly lower than BPN, and is strongly superior to PNN. Furthermore, the variable weights of APNN really express the importance of input variables for output variables, which provides the model with explanation abilities.

關鍵字:artificial neural network, probabilistic neural network, variable importance, function mapping, classification.