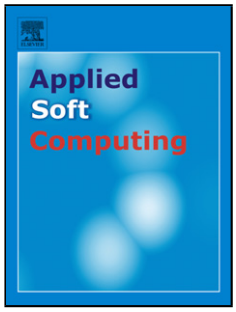

Title: Bi-Modal Derivative Adaptive Activation Function Sigmoidal Feedforward Artificial Neural Networks

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Highlights for Review

1. The generally used activation functions in sigmoidal feedforward artificial neural networks use activation functions whose derivatives w.r.t. the net input to the node has a single maxima (uni-modal).
2. The current work uses a bi-modal (twin maxima) derivative sigmoidal activation function artificial neural network.
3. The activation function has an adaptive parameter (*a*) that controls the position of the two maxima's of the derivative of the activation function.
4. Four activation functions with bi-modal derivatives are used.
5. The adaptive bi-modal derivative activation function neural network efficiency and efficacy is compared against the standard *logsigmoid* activation function network, shifted *logsigmoid* (by ½) activation function network, adaptive amplitude activation function neural network and adaptive slope activation function neural network.
6. These networks are compared on a set of 10 function approximation tasks and 4 benchmark problems.
7. The results obtained demonstrate that the proposed / used adaptive activation functions are demonstratively as good as if not better than the sigmoidal function without any adaptive parameter and is also better than amplitude adaptation or slope adaptation of the sigmoidal activation function.