

Accepted Manuscript

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

Author: Akash Mishra Pravin Chandra Udayan Ghose Sartaj
Singh Sodhi



PII: S1568-4946(17)30541-0
DOI: <http://dx.doi.org/doi:10.1016/j.asoc.2017.09.002>
Reference: ASOC 4449

To appear in: *Applied Soft Computing*

Received date: 23-1-2016
Revised date: 10-8-2017
Accepted date: 3-9-2017

Please cite this article as: Akash Mishra, Pravin Chandra, Udayan Ghose, Sartaj Singh Sodhi, Bi-Modal Derivative Adaptive Activation Function Sigmoidal Feedforward Artificial Neural Networks, *Applied Soft Computing Journal* (2017), <http://dx.doi.org/10.1016/j.asoc.2017.09.002>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

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 $\frac{1}{2}$) 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.

Download English Version:

<https://daneshyari.com/en/article/4962961>

Download Persian Version:

<https://daneshyari.com/article/4962961>

[Daneshyari.com](https://daneshyari.com)