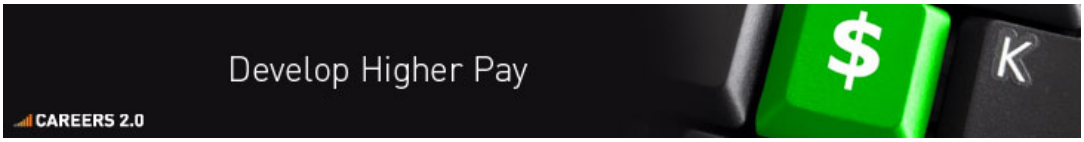
Encog Neural Network Error Never Changing



I'm getting started working with neural networks. I have adapted the XOR example provided for my own purposes, but when I run it the error never changes.

The function I'm trying to approximate takes 4 doubles and outputs 1 double, the 4 inputs are always positive, the output can be negative or positive (majority is positive). For starters I am using 50 records to train the data.

Working XOR (The error goes down with each iteration)

```
public static double[][] XORInput = {
    new[] {0.0, 0.0},
    new[] {1.0, 0.0},
    new[] {0.0, 1.0},
    new[] {1.0, 1.0}
};

public static double[][] XORIdeal = {
    new[] {0.0},
    new[] {1.0},
    new[] {1.0},
    new[] {0.0}
};

BasicNetwork network = new BasicNetwork();
network.AddLayer(new BasicLayer(null, true, 2));
network.AddLayer(new BasicLayer(new ActivationSigmoid(), true, 3));
network.AddLayer(new BasicLayer(new ActivationSigmoid(), false, 1));
network.Structure.FinalizeStructure();
network.Reset();

IMLDataSet trainingData = new BasicMLDataSet(XORInput, XORIdeal);

IMLTrain train = new ResilientPropagation(Network, trainingData);
```

Not Working (the error never goes down):

```
BasicNetwork network = new BasicNetwork();
network.AddLayer(new BasicLayer(null, true, 4));
network.AddLayer(new BasicLayer(new ActivationSigmoid(), true, 6));
network.AddLayer(new BasicLayer(new ActivationSigmoid(), false, 1));
network.Structure.FinalizeStructure();
network.Reset();

IMLDataSet trainingData = new BasicMLDataSet(myInput, myExpectedOutput);

IMLTrain train = new ResilientPropagation(Network, trainingData);
```

A few sample records of the training data:

```
Input:
2.54, 3.15, 3.4, 1.73
5.3, 1.78, 3.9, 2.04
1.71, 5.4, 4.3, 2.26
1.62, 6.4, 4, 1.89
1.45, 8.4, 5.2, 2.14

Output:
5.59
11.05
6.89
10.4
-0.56
```

I believe that the problem is that activation function isn't firing. I thought it might be because ActivationSigmoid() is inappropriate for this problem, but I have tried ActivationTANH() with the exact same results.

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edited Mar 21 at 11:27

asked Mar 21 at 11:20

Watson

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1 Answer

The problem is that my values weren't being normalised.

To work with the activation functions all of your inputs and outputs must be between 1 and 0 (ActivationSigma) and -1 and 1 (ActivationTANH). You need some function to normalise your values to the range that they need to be.

This link was of great help to me:

http://www.heatonresearch.com/wiki/Range_Normalization

answered Apr 3 at 6:18

Watson

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