

Cinthia Valdéz Guillen A01203141
Cristian Alexsis González Jaime A01204478
Luis Pablo Morales Cruz A01205724
Report Implementing Neural Networks

For this perceptron implementation, there are two parameters that can be modified: the number of iterations and the learning rate.

The number of iterations as its name suggest, is the number of iterations the training of the neural will take for. In the other hand, the learning rate parameter determines how the actual value affects the weights values.

Multiple test was to observe and compare the result of the ANN given different parameters. When setting the learning rate to a big number, the weight values change in bigger steps and therefore the corrections in the network are more “drastic”. With a small learning rate the network is adjusted slowly but it implies many iterations. With a small number of iterations, the training is faster but is possible to not get the correct results.

In this report, we are going to present the result obtained using three different learning rates: small number = 0.1, big number = 100 and standard number = 1. For the number of iterations, we are considering 1000, 5000 and 10000.

Learning rate	Iterations	Error
0.1	1000	18%
0.1	5000	12%
0.1	1000	8%
100	10000	9%
100	5000	8%
100	10000	5%
1	1000	7%
1	5000	5%
1	10000	4%

*The excel file is included for reference.

Neural networks are good for classification problems. The only requirement is to have enough data to train the network to get the expected results. As it was described in the previous paragraphs, it is also important to select the appropriate parameters for better results.

It takes some time to implement the network and some more time to test and adjust it, but after that the network can deal with different inputs and give correct results (if properly trained). Taking this into account it is a good method for complex classification problems.

As it was mentioned, neural networks do not work fine with problems with small data sets, because there is not enough information for the training process and there is a possibility to not get the desired results.