Name: Zenish Yopinbhai Patel

Student number: 7898869

Project proposal Comp 3190

Training multilayer networks using back propogation algorithm

Overview:

Multilayer neural networks are one of the primary elements of Artificial Intelligence's demesne. As the name suggests these networks are made up of multiple layers and it's main function is to work on the low quality input provided from one end and then process it in it's multiple layers and give us output which we can consider as smart. They are trained to do so using different types of algorithmsand one of them is using back propogation algorithm.

Objective:

A.I has many uses such as recognizing images, voices human like thinking and many more. All these are possible due to multilayer networks and teaching these networks how to get proper expected output is not an easy task. We have several algorithms to do that. However, it is crucial that the algorithm we use is fast, efficient and should work on any type of network (knnown or unknown). Back propogation algorithm is one of such algorithms.

My project will have a detailed explaination of what are multilayer networks, how they are helpful to us and how to train them with back propogation algotithm.

Also, what this back propogation algorithm is and how it works.

What is Gradient decent, what it does and how it is related to back propogation algorithm.

What is delta rule.

What is the core concept of the Back propogation algorithm (How it calculates the error) and it's types.

How it imporves the efficiency of multilayer network's learning by reducing the error in findng the output so that it is really similar to the expected output.

Sometimes Image or voice recognition fails to identify the correct picture or voice which shows that the way we train the algorithm is not efficient enough and thus it has some limitations I will try to explain the reason behind the failure of this algorithm and how it loses efficiency in some cases.

And at the end i will state some ways to counter those limitations.

Conclusion:

To sum up my project is about how the multilayer neural networks are trained with the help of backpropogation algorithm and what are it's limitations and how to improve it.

References

Andrew Blais, David Mertz. *https://developer.ibm.com/articles/l-neural/*. 1 July 2001.

Ian Goodfellow, Yoshua Bengio, Aaron Courville. *Deep Learning*. MIT Press, 2016. Book.

John, Paul. "Beyond regression : new tools for prediction and analysis in the behavioral sciences." January 1974.

Rojas, Ra`ul. *Neural Networks: A Systematic Introduction*. Berkeley, California: Springer, n.d. Book.

Y. LeCun, B. Boser, J.S Denker, D. Henderson, R.E. Howard, W.Hubbard, L.D.Jackel. "Backpropogation Applied to Handwritten Zip Code Recognition." 12 September 1989.