Review of „Fundamentals of Neural Networks”

The paper “Fundamentals of Neural Networks” is well written. The language is suitable for academic purposes and can be easily read by the targeting group.

The equations and figures are properly described, and the reader do not need any previous knowledge to follow the line of thoughts. Though the backpropagation equations are not as good described as it could be. Perhaps an illustration on how the backpropagation works would make it easier to understand the equations intuitively. The space needed could be gained by removing the figure of the logistic sigmoid activation function since it is not necessarily to understand that the function lays between 0 and 1.

The structure of the paper and the line of thoughts is well made and easy to follow, especially since it is described in the introduction. The introduction and the conclusion are fitting well together and serve their purpose. The abstract covers all the statements made in the paper. Sadly, there is only on training method (stochastic gradient descent using backpropagation) described. This is probably because of the limitation of the maximum paper length. However, it could be more clearly stated why the stochastic gradient descent is the common used learning algorithm in a few sentences.

In addition to the training algorithms it may be good to explain the difference in the activation function more clearly, for instance why logistical sigmoid and not tanh. Again, perhaps only in one or two sentences. The same for the cost function. Why is the cross entropy better for classification error and the mean squared error for regressions? It could enlighten the reader more in to some of the details of neural networks.

If the length of the paper would get too long, consider making the perceptron learning subject smaller since it is not necessary to know how perceptrons were trained.

In conclusion the paper is very good, though at some points more information could be given on why which algorithm is used. The language is good, formal and suitable for academic purposes. The paper is easy to understand without any previous knowledge of the topic and a good starting point in machine learning, though it has only one learning algorithm included. The whole paper uses a vast number of sources and references which is good to use it as a starting point for more detailed papers.

Remarks:

The annotation of the pdf follows this color scheme:

Yellow – Sentence is not necessary / does not include any information

Blue – Questionable statement (perhaps add source or reference)

Pink – More details or reasons would be great