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Artificial Intelligence
B.Tech ICT/CE Semester VI, Winter Semester 2020
Lab1: Basic programming constructs in SciLab

Preamble

Scilab [1] is a free and open source software for engineers & scientists, with a long history (first release in 1994) and a growing community. This assignment is carried out to understand basic programming constructs [2] in Scilab such as Loops, User-defined and built-in functions, Matrices and plots.

Exercises

Q1. Practice all the exercise from Scilab Tutorial.

Q2. Plot the activation functions used in Neural Networks.

1. Sigmoid, $f(x) = 1 \div (1 + e^{-x})$
2. ReLU, $f(x) = max(0, x)$
3. Leaky ReLU, $f(\alpha, x) = \alpha x \; for \; x < 0$; $f(a, x) = x \; for \; x >= 0$,where α is a small constant.
4. Tanh, $f(x) = 1 - exp(-2x) \; / \; 1 + exp(-2x)$
5. Exponential Linear Unit,
   $f(\alpha, x) = \alpha(e^{x} - 1) \; for \; x < 0$; $f(\alpha, x) = x \; for \; x >= 0$,where α is a small constant.

- Study each activation functions, and write its property.
- Change the parameter of the activation function, find their impact and write comments.
- Draw the structure of all the mentioned activation functions.

Q3. Visit Artificial Intelligence Playground and observe the following demonstration.

- Visit http://nvidia-research-mingyuliu.com/ganimal to visualize Image-to-Image Translation.
- Visit https://gincker.com/AI/convolutional-neural-network to visualize Handwriting (numbers) recognition using CNN. Observe loss function and accuracy of the network by changing hyper-parameter (epochs, learning rate, batch size, and training size).

References

[1] https://www.scilab.org/about/scilab-open-source-software

[2] https://www.scilab.org/tutorials/scilab-beginners-%E2%80%93-tutorial