Homework #2

CIS 585 – Advanced Artificial Intelligence
University of Michigan - Dearborn
John P. Baugh, Ph.D.

Objectives

- To learn more about biological neurons
- To learn more about artificial neurons

Instructions

For this assignment, you will write a short report consisting of two distinct parts. You do not need to use a particular style guide (e.g., MLA, APA, IEEE), but should give citations of where you learned about the material you gave for your report. Although there are two distinct topics, you should contain all the information in a **single PDF file**. It should be clear where part 1 ends, and where part 2 begins, which may be achieved by using a header (e.g., in MS Word or comparable software).

The descriptions of each of the two parts for which you are responsible are as follows:

Part 1: Biological Neurons

Neurons of humans contain several distinct parts and interacting cell types/structures. Choose two of the following parts or related topics, and describe their function within or related to the biological neuron.

- Nucleus
- Endoplasmic reticulum
- Mitochondrion
- Golgi apparatus
- Axon hillock
- Myelin sheath
- Oligodendrocyte

Part 2: Artificial Neurons

For this part of the report, select an activation function and describe its mathematical properties, how it fits within the function of an ANN. Possible options for activation functions are as follows:

- Linear combination
- Logistic
- ReLU (Rectified Linear Unit)
- Leaky ReLU
- TanH (hyperbolic tangent)
- PReLU (Parametric ReLU)
- Softmax
- Swish
- GeLU (Gaussian Error Linear Unit)
- SeLU (Scaled Exponential Linear Unit)

You may find and select one that is not in the list, but you may choose one from the list.

Deliverables

You should upload your report (in PDF format), named ***name*_cis_585_hw2_w23.pdf**, where *name* is your name in the following format: *firstname_lastname*, such as *john_baugh*. (firstname = given name, lastname = family name).