

Intelligent Systems: Reasoning and Recognition

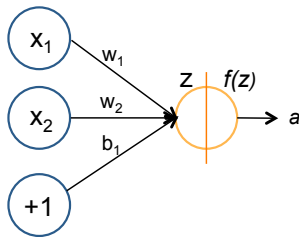
James L. Crowley

MoSIG M1
Exercise 4

Winter Semester 2021

Artificial Neural Networks.

You are presented with a single neuron with two inputs (x_1, x_2) and a single output, computed using a sigmoid, $\sigma(z)$. Your network has been initialized with weights $w_1=0.1$ and $w_2=-0.2$ and $b=0.2$. Assume a learning rate of $\eta=0.1$. Your neuron should be trained to recognize the following training data:



m	x_1	x_2	y_m
1	0	1	0
2	1	0	0
3	1	1	1
4	0	0	1

- Compute z and a for $m=1$.
- Compute $\delta_m^{(out)} = (a - y_m)$ for $m=1$.
- Compute δ_m for $m=1$. (δ_m is the error propagating back from the neuron)
- Compute Δw_1 , Δw_2 , and Δb for $m=1$.
- Update w_1 , w_2 , and b for $m=1$.
- Will your neuron converge for this training data?