

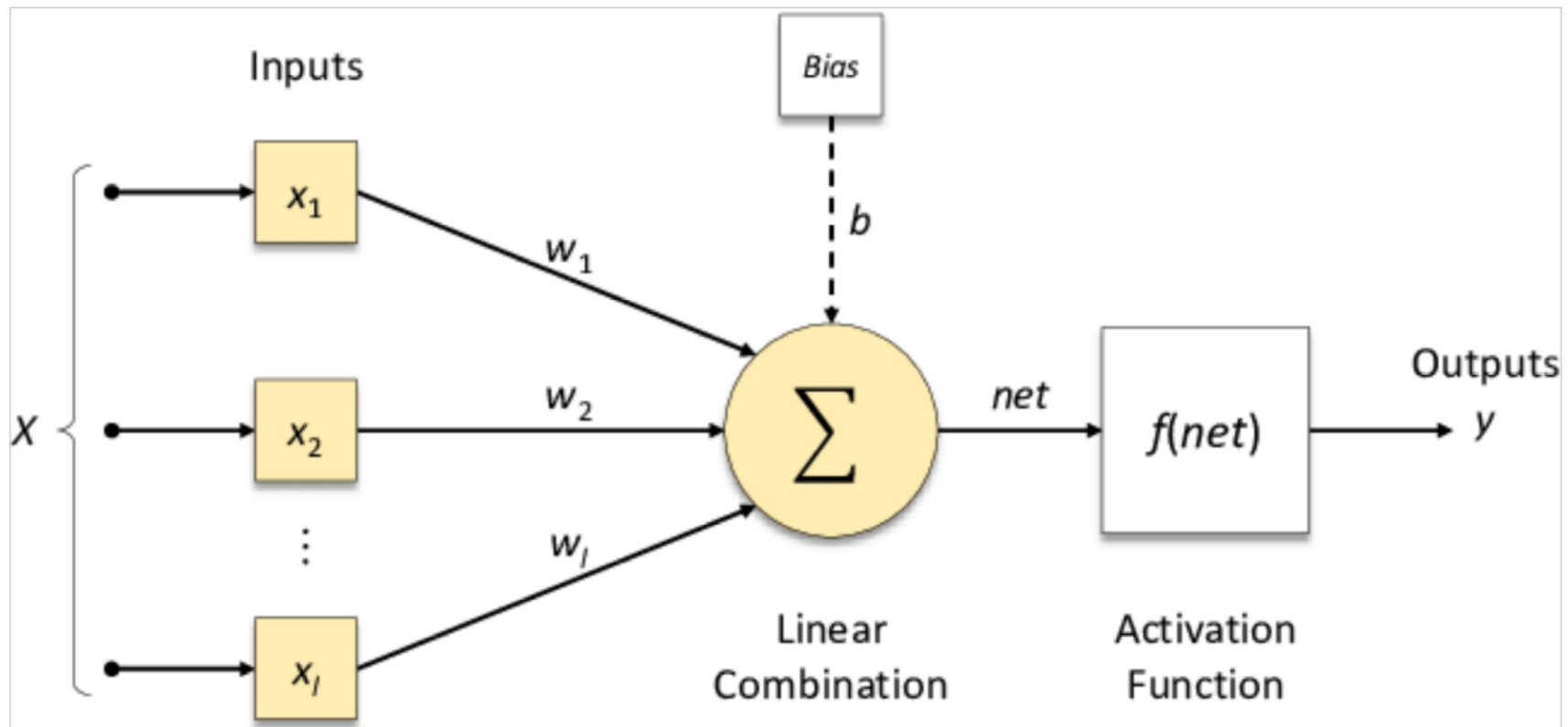


DSHL Summer School 2022

Day 2: Perceptron

Martin Antenreiter

Perceptron

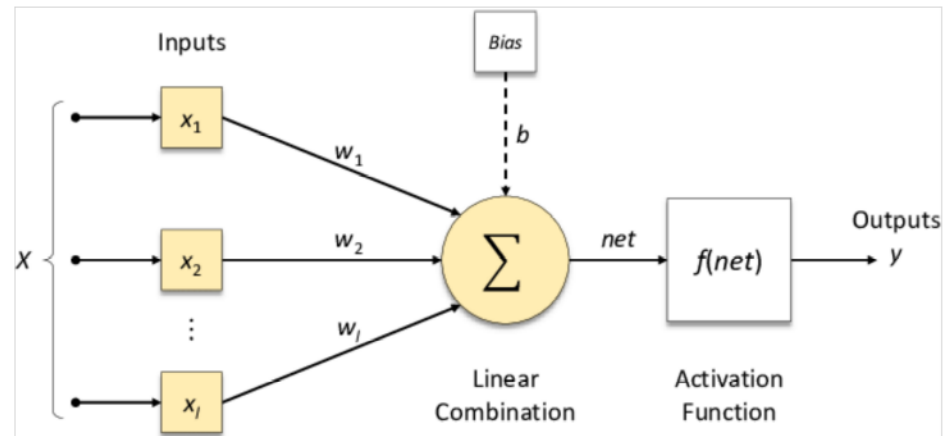


$$net = \sum_{i=1}^n x_i w_i + b$$

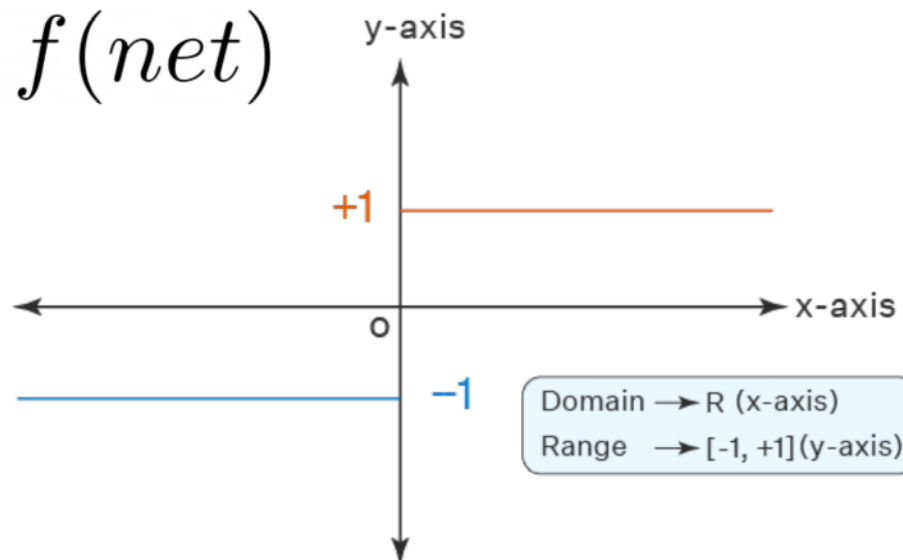
$$y = f(net)$$

Perceptron

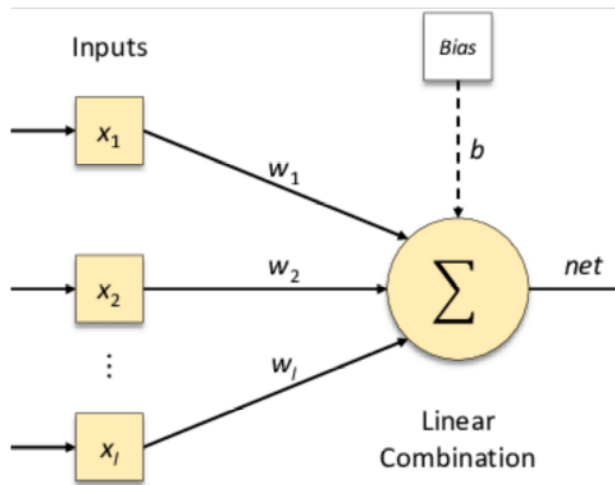
$$net = \sum_{i=1}^n x_i w_i + b$$



$$y = f(net)$$



Function of the Neuron



$$net = \sum_{i=0}^n x_i w_i$$

$$b = w_0 \text{ with}$$

$$x_0 = 1$$

The bias is usually represented by the weight with the index 0 and the input vector is extended by one digit.

Perceptron Rule

- Rosenblatt's initial perceptron rule is fairly simple and can be summarized by the following steps:
 - Initialize the weights to small random numbers.
 - For each training sample x :
 - Calculate the output value

$$net = \sum_{i=0}^n x_i w_i$$

- If we made an error, update the weights

$$w_{new} = w_{old} + \eta \Delta w$$

Perceptron Rule

- If we made an error, update the weights

$$net = \sum_{i=0}^n x_i w_i$$

$$w_{new} = w_{old} + \eta \Delta w$$

$$\Delta w_i = (target - output) x_i$$