

Neural Network Evaluation

(a) (1, 0) (b) T T F T

Introduction to AI and ML

T T F T T F T F F F T F T T T T

Ethical and Societal Concerns in AI

F T F T T T

The rest of the solution can be found in the original paper.

Evaluation of an AI System

(a) 7 / 10

(b) (1/2, 9/10)

(c) 0.7

(d) 2 and 3

Backpropagation

(a)

$$\frac{\partial L}{\partial S} = \frac{\partial L}{\partial S} \cdot \frac{\partial y}{\partial S} = (y - y_d) \cdot \frac{1}{1 + \exp(S)} \cdot \exp(S)$$

(b)

$$\frac{\partial S}{\partial w} = x$$

(c)

$$\frac{\partial L}{\partial w} = \frac{\partial L}{\partial S} \cdot \frac{\partial S}{\partial w} = (y - y_d) \cdot \frac{1}{1 + \exp(S)} \cdot \exp(S) \cdot x$$

(d)

$$w_{\text{new}} = w - r \cdot \frac{\partial L}{\partial w} = w - 0.4 \cdot (y - y_d) \cdot \frac{1}{1 + \exp(S)} \cdot \exp(S) \cdot x$$