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CMPT465 – Neural Networks and Learning Systems

Homework 1

1. Design Hebb function

A white background with black text

Description automatically generated

1. Using Hebb function, apply i/o mappings described by all 16 Boolean functions of 2 variables.

A group of small black and white lines

Description automatically generated with medium confidence

From the results it is shown that the Hebbian rule implemented does not apply for XOR and NXOR gates. This is supported by non-linear separability.

1. Usi Using Hebb function, apply i/o mappings described by all 16 Boolean functions of 2 variables. With variables switched to [1, 0.5, -0.5, -1] and [1, -0.3, 0.7, -1].

A screenshot of a computer

Description automatically generated

When the inputs are continuous from 1 to -1, the Hebbian rule is failed to be implemented by the weights obtained for both XOR and NXOR functions, as well as any Boolean function that includes NOT: x1\*x2’; x1’\*x2; x1|x2’; x1’|x2