

Linear and non-linear classifiers

Machine Learning

Prof Hans Georg Schaathun

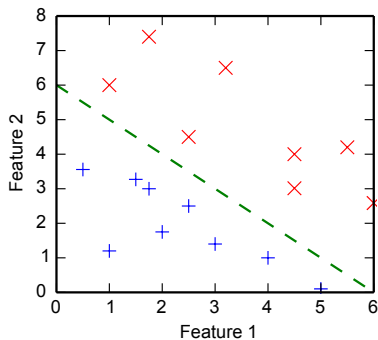
Høgskolen i Ålesund

February 2, 2015

hials

Recollection

- 1 The single neuron is a linear classifier

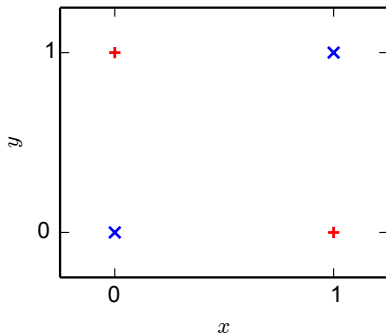


The XOR problem

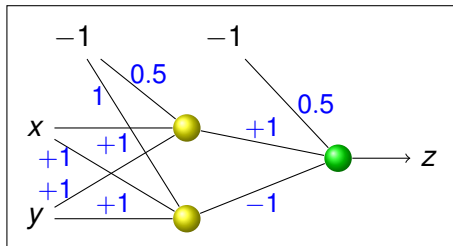
Features	Class
x, y	$x \oplus y$
0,0	0
0,1	1
1,0	1
1,1	0

The XOR problem

Features	Class
x, y	$x \oplus y$
0,0	0
0,1	1
1,0	1
1,1	0



A solution for XOR



- 1 Three neurons
- 2 A **hidden layer** (yellow neurons)

Summary

- 1 Hidden layers of neurons
 - allows for non-linear classifiers
- 2 Implement the neural network which solves the XOR problem
 - constant weights – no learning
 - `recall` function
- 3 Taster
 - We will train multi-layer networks on Monday