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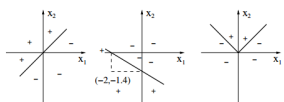
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Perceptron find weight exercise

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I have some difficulties with the following exercise.

There are three different diagrams. If possible, find the perceptron-weights w_0 , w_1 , and w_2 for each of them (the decision surface is clearly divided into two regions, one "positive" the other one "negative").



Solution: for diagram 1 it's obvious that the function is $x_2 = x_1$, does it mean that $w_0 = 0$, $w_1 = -1$, $w_2 = 1$?

$0.7x_1 + x_2 + 1.4 = 0$,
does it mean that
 $w_0 = 1.4, w_1 = 0.7, w_2 = 1$
? If the direction makes
any sense here?

for diagram 3, $x_2 = |x_1|$,
I am not sure how to
define weight.

machine-learning

asked Feb 2 '14 at 15:42



user16168

337 1 6 19

2 Answers

Your solutions for 1 and 2 are correct, since the [perceptron](#)'s weight vector is perpendicular to the [decision boundary](#).

For diagram 3, there is no solution because the perceptron is a [linear classifier](#) (i.e. the decision boundary is [always](#) a single line).

answered Feb 2 '14 at 15:52



Franck Démoncourt

936 2 9 28

Classifier for 1 is correct.
Classifier for 2 is incorrect:

Test with your classifier ($w_0 = +1.4, w_1 = +0.7, w_2 = 1$) and $x_1 = -3, x_2 = 0$:

$y = \text{step}(w_0 + w_1 * x_1 + w_2 * x_2)$

Classifier 2 **should** be:

$$w_0 = -1.4, w_1 = -0.7, w$$

.

Test for classifier 2 with

$$x_1 = -3, x_2 = 0:$$

$$y = f_{\text{step}}(w_0 + w_1 * x_1 +$$

--> **correct
classification as (+)**

As already mentioned in
the above answer, the
3rd example cannot be
separated by a single
perceptron.

answered Feb 11 '17 at 21:04



TriceratopsMagician

1