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3. Decision Boundaries

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Homework due Feb 22, 2023 08:59 -03 Past due

In this problem, we will investigate the decision boundary of different classifiers.

3. (a)

2 points possible (graded)

Consider the function defined over three binary variables: $f(x_1, x_2, x_3) = (\neg x_1 \wedge -$

We aim to find a θ such that, for any $x = [x_1, x_2, x_3]$, where $x_i \in \{0, 1\}$:

$$\theta \cdot x + \theta_0 > 0 \text{ when } f(x_1, x_2, x_3) = 1, \text{ and}$$

$$\theta \cdot x + \theta_0 < 0 \text{ when } f(x_1, x_2, x_3) = 0.$$

If $\theta_0 = 0$ (no offset), would it be possible to learn such a θ ?

☐ Yes

☐ No

Would it be possible to learn the pair θ and θ_0 ?

☐ Yes

☐ No

Submit

You have used 0 of 3 attempts

3. (b-1)

1 point possible (graded)

Submit

You have used 0 of 3 attempts

3. (b-2)

2 points possible (graded)

Inside (positive) or outside (negative) of an (x_0, y_0) -centered circle with radius r .

:

:

Submit

You have used 0 of 3 attempts

3. (b-3)

1 point possible (graded)

Strictly above (positive) or below (negative) a line through the origin with normal (a, b) . Here we define "above" as $ax + by > 0$, and define "below" similarly. **Note:** Please enter a list for (a, b) as $[a, b]$. If there is no solution, enter $None$.**Submit**

You have used 0 of 3 attempts

3. (b-4)

2 points possible (graded)

Strictly above (positive) or below (negative) a line with normal (a, b) and offset c . Here we define "above" as $ax + by > c$, and define "below" similarly. **Note:** If there is no solution, enter $None$.

:

☐ Strictly above or below a line through the origin with normal \mathbf{n} .

☐ Strictly above or below a line with normal \mathbf{n} and offset c .

Submit

You have used 0 of 2 attempts

Discussion

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Topic: Unit 1: Linear Classifiers and Generalizations (2 weeks), Homework 1 / 3.
Decision Boundaries



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