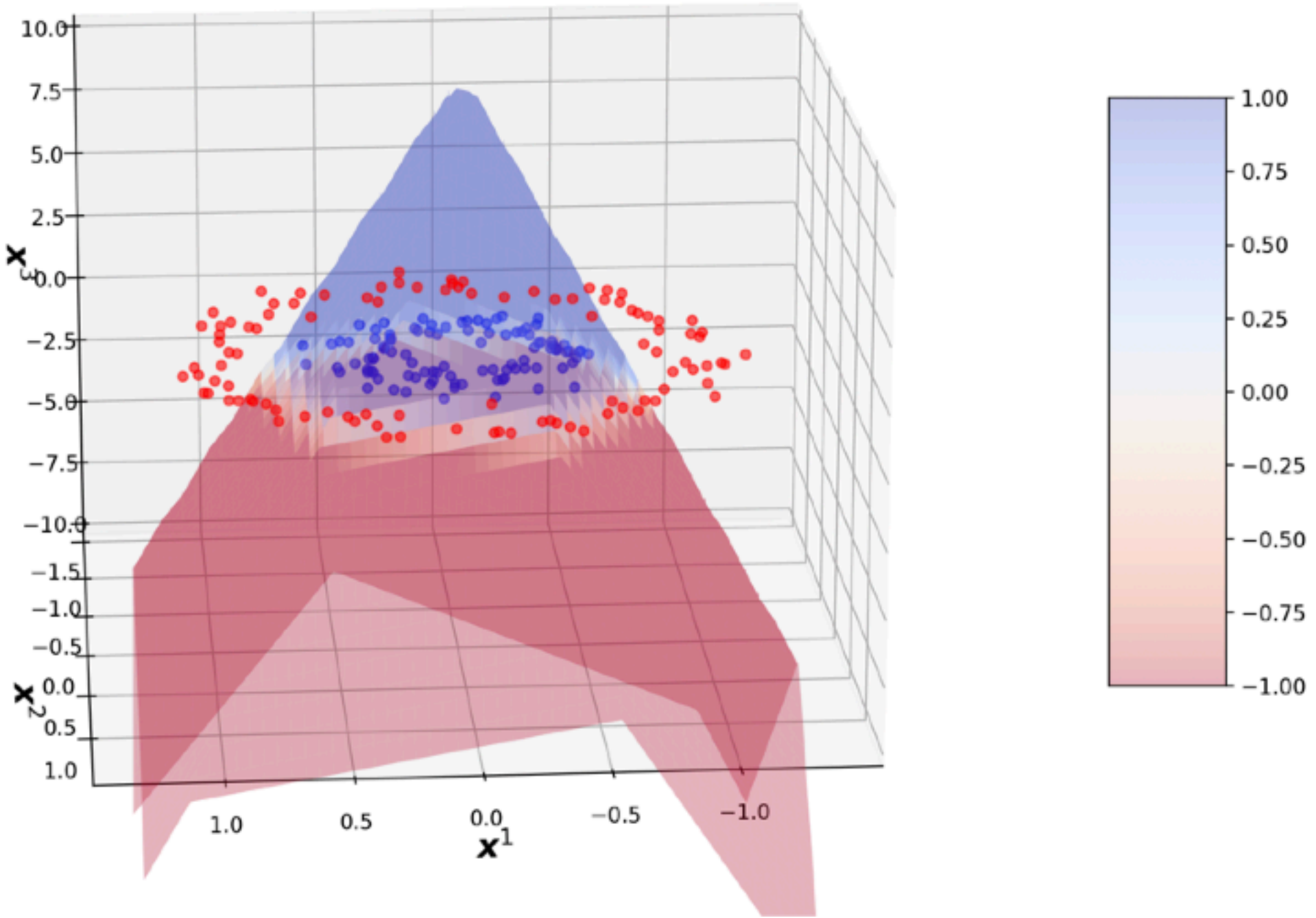

INSEA


10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
−10.0
$x^3$
−1.5
−1.0
−0.5
0.0
0.5
1.0
$x^2$
1.0
0.5
0.0
−0.5
−1.0
$x^1$
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
−0.75
−1.00

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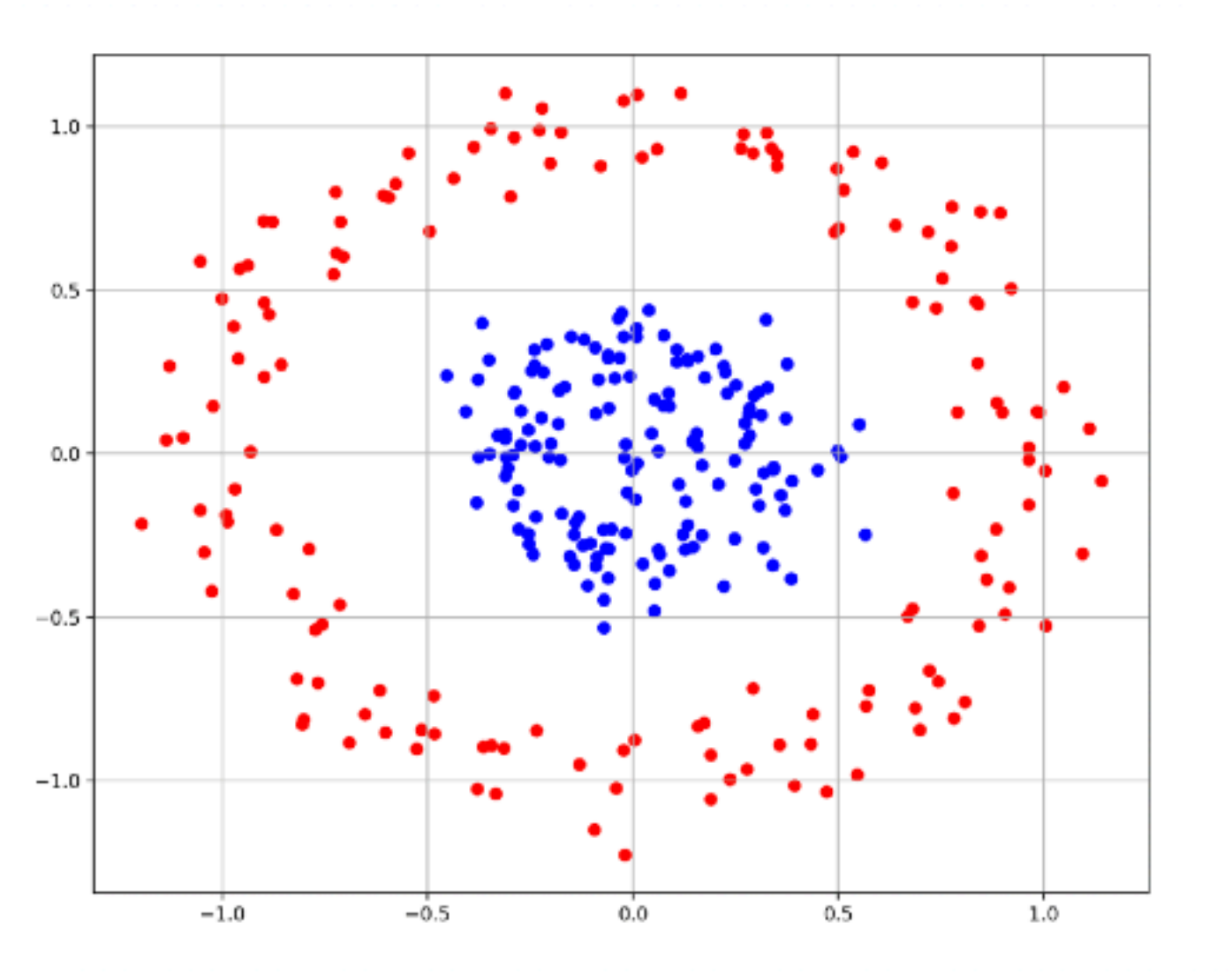
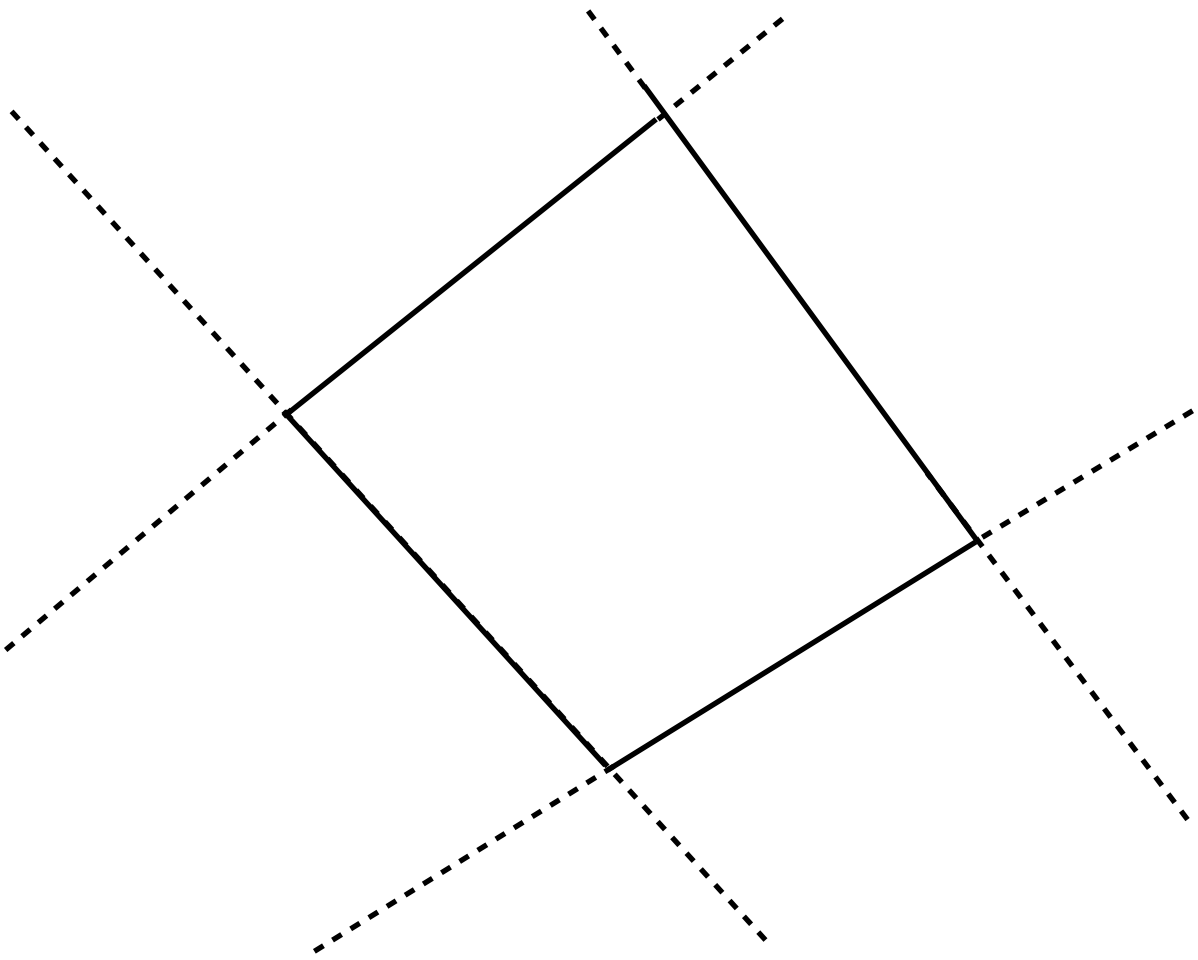
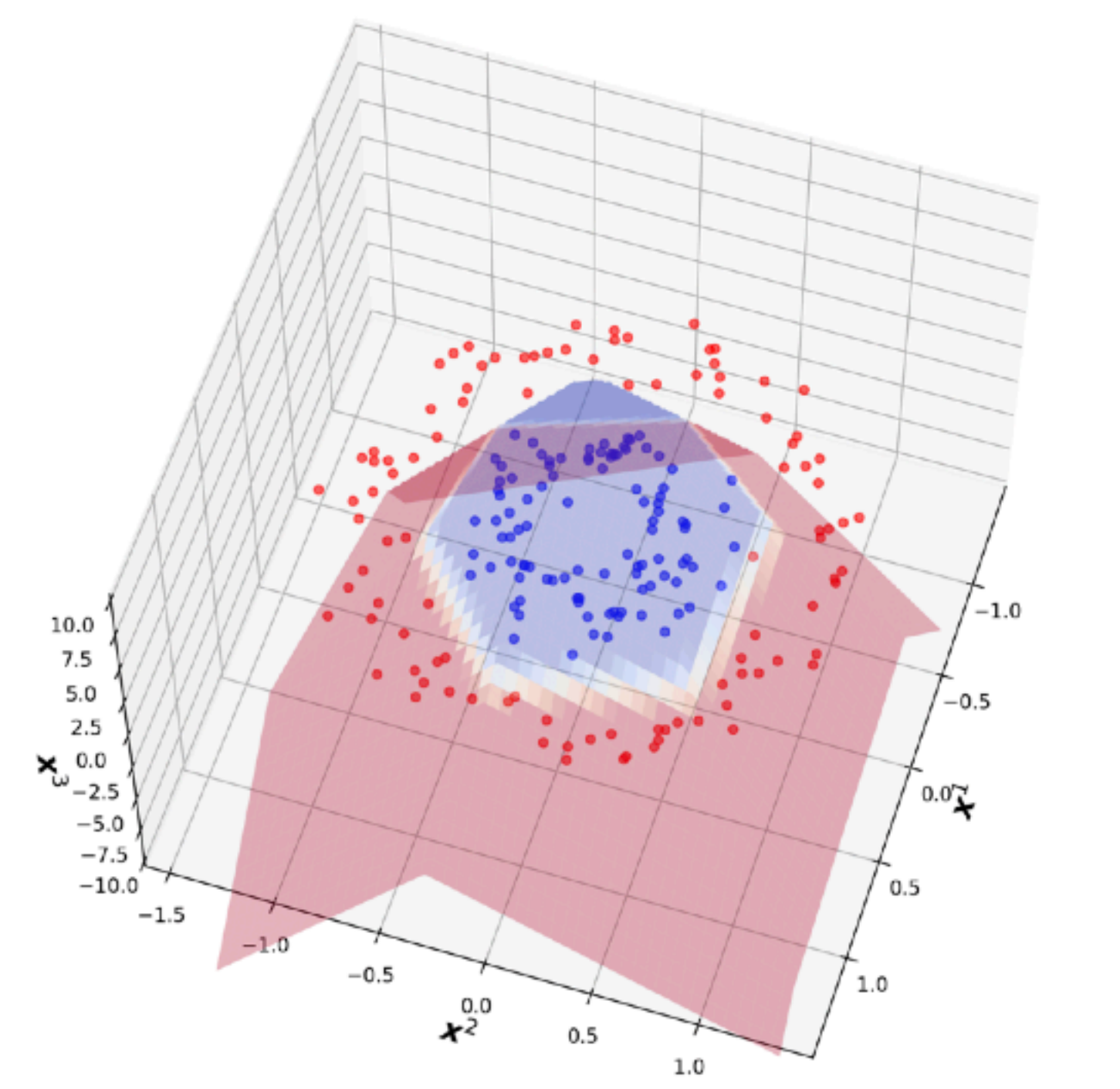
# Machine learning classique

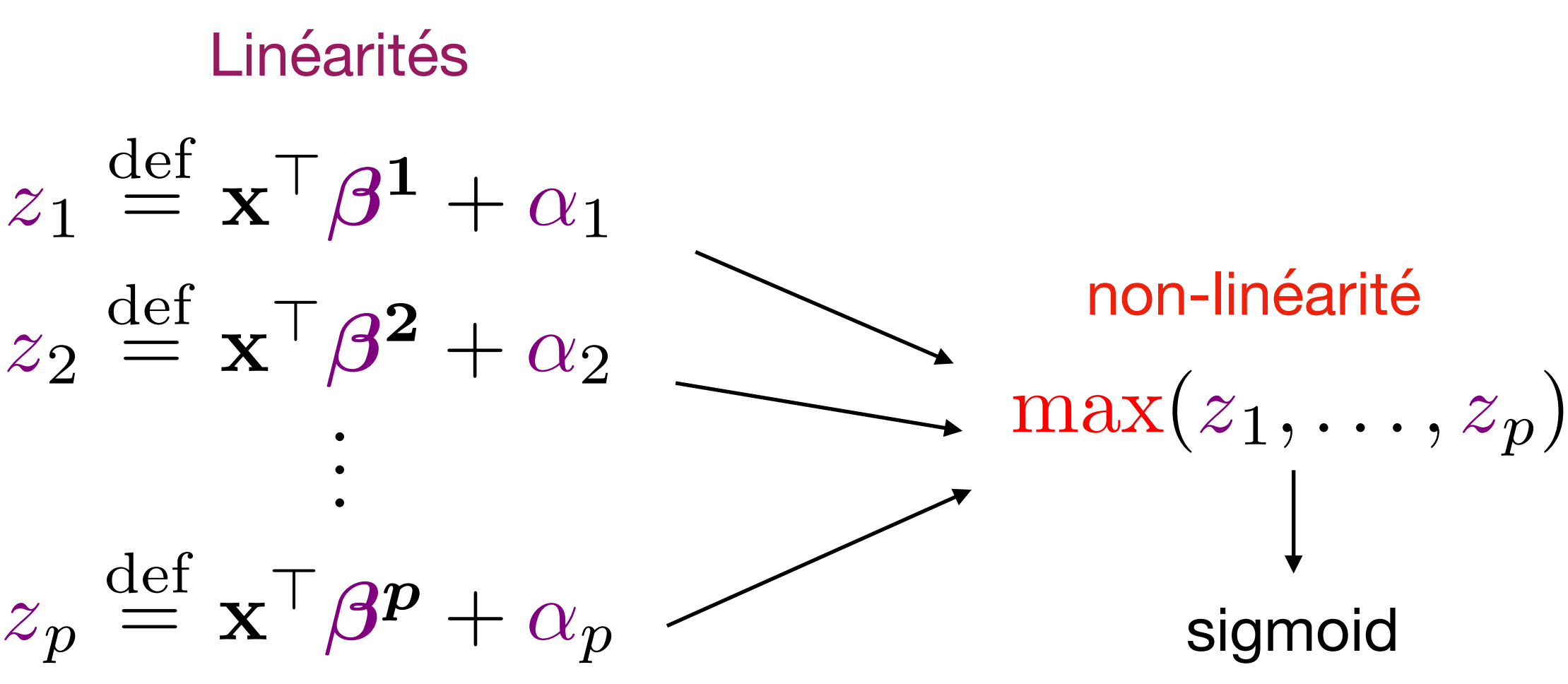
# Intro to neural nets


1.0
0.5
0.0
−0.5
−1.0
−1.0
−0.5
0.0
0.5
1.0

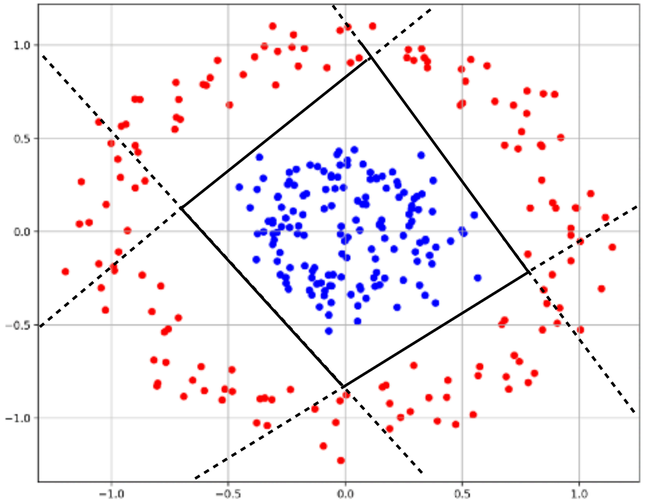
# Comment adapter ce modèle à des données plus complexes ?




10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
−10.0
$x^3$
−1.5
−1.0
−0.5
0.0
0.5
1.0
$x^2$
−1.0
−0.5
0.0
0.5
1.0
$x^1$


Linéarités
$z_1 \stackrel{\text{def}}{=} \mathbf{x}^\top \boldsymbol{\beta}^{\mathbf{1}} + \alpha_1$
$z_2 \stackrel{\text{def}}{=} \mathbf{x}^\top \boldsymbol{\beta}^{\mathbf{2}} + \alpha_2$
$z_p \stackrel{\text{def}}{=} \mathbf{x}^\top \boldsymbol{\beta}^{\boldsymbol{p}} + \alpha_p$
non-linéarité
$\max(z_1, \ldots, z_p)$
sigmoid

Comment adapter ce modèle à des données plus complexes ?



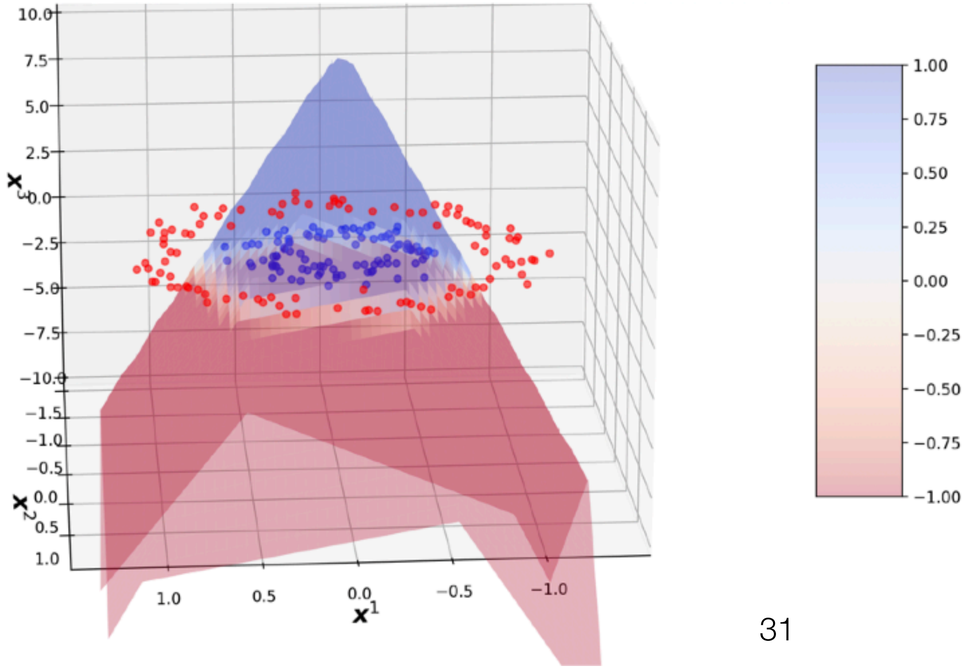
Linéarités

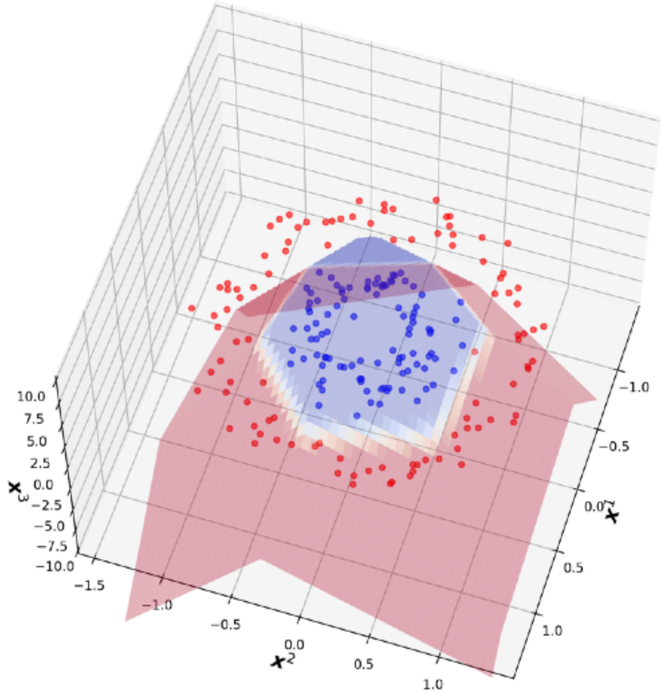
$$z_1 \overset{\text{def}}{=} \mathbf{x}^\top \boldsymbol{\beta^1} + \alpha_1$$
$$z_2 \overset{\text{def}}{=} \mathbf{x}^\top \boldsymbol{\beta^2} + \alpha_2$$
$$\vdots$$
$$z_p \overset{\text{def}}{=} \mathbf{x}^\top \boldsymbol{\beta^p} + \alpha_p$$

non-linéarité

$$\max(z_1, \ldots, z_p)$$

sigmoid





Comment adapter ce modèle à des données plus complexes ?