



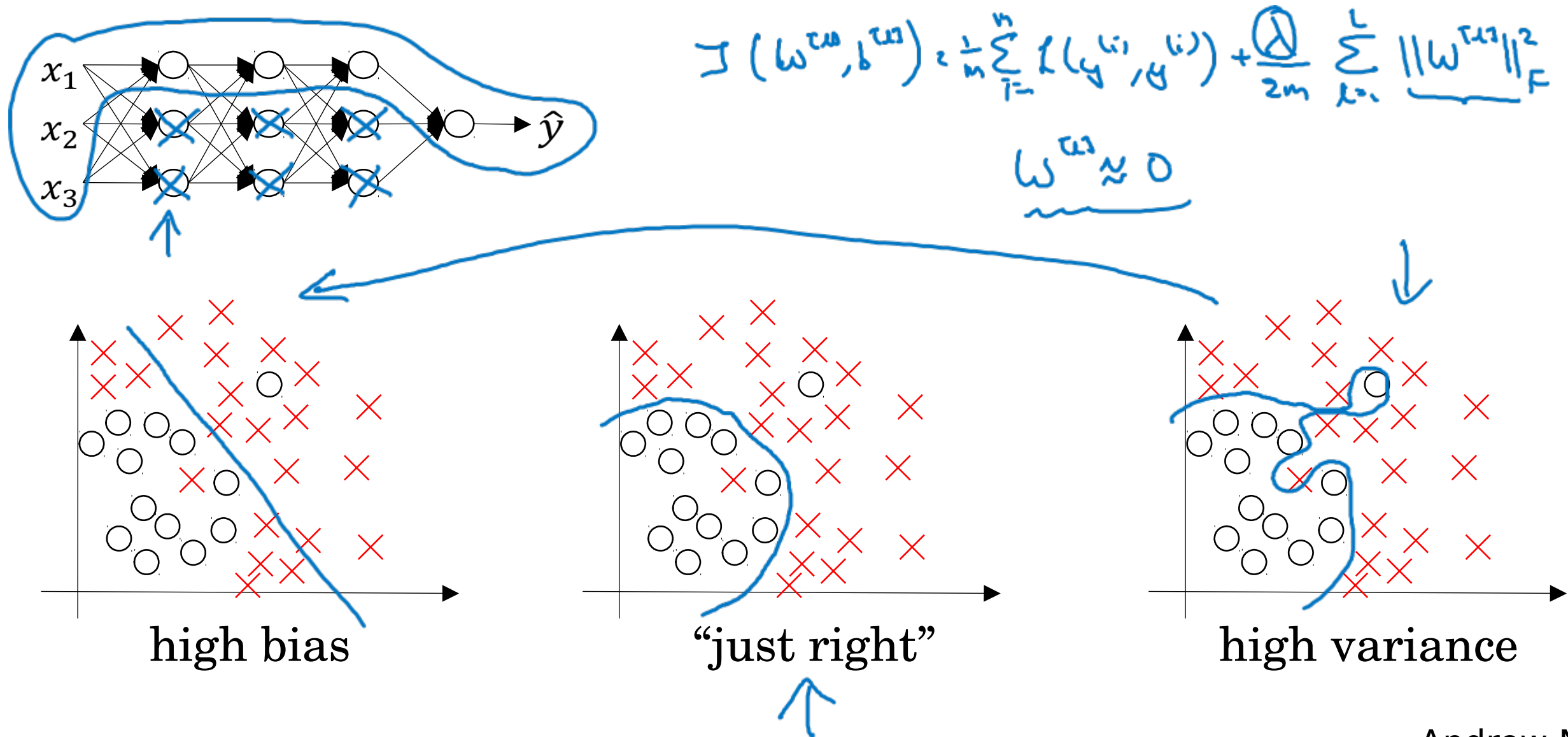
**deeplearning.ai**

# Regularizing your neural network

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Why  
regularization  
reduces

# How does regularization prevent overfitting?



# How does regularization prevent overfitting?



$$g(z) = \tanh(z)$$

$\lambda \uparrow$

$\underline{W}^{[L]} \downarrow$

$$z^{[L]} = \underline{W}^{[L]} a^{[L-1]} + \underline{b}^{[L]}$$

Every layer  $\approx$  linear.



$$J(\dots) = \underbrace{\sum_i \mathcal{L}(\hat{y}^{(i)}, y^{(i)})}_{\text{training loss}} + \underbrace{\frac{\lambda}{2m} \sum_L \|W^{[L]}\|_F^2}_{\text{regularization term}}$$

