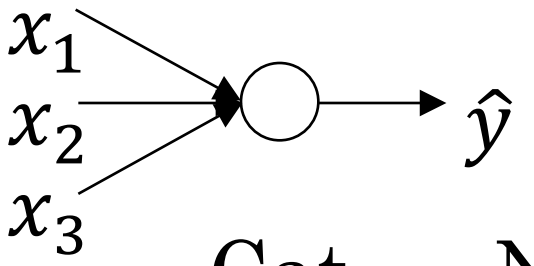
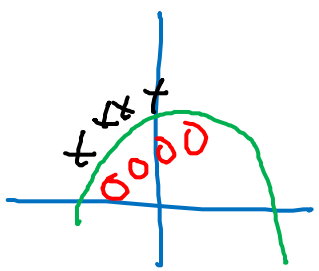
deeplearning.ai

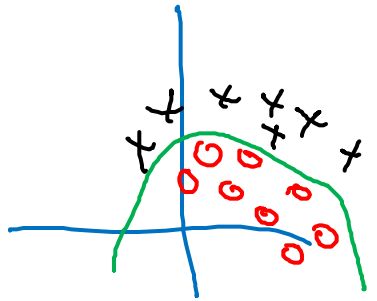
Batch Normalization

Why does Batch Norm work?

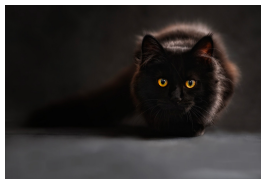
Learning on shifting input distribution



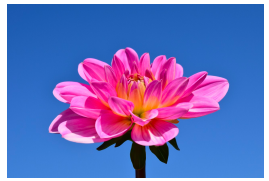




Cat
$y = 1$



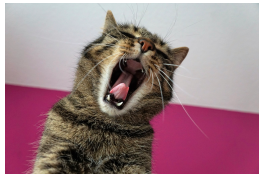
Non-Cat
$y = 0$



"Covariate shift"

$X \rightarrow y$

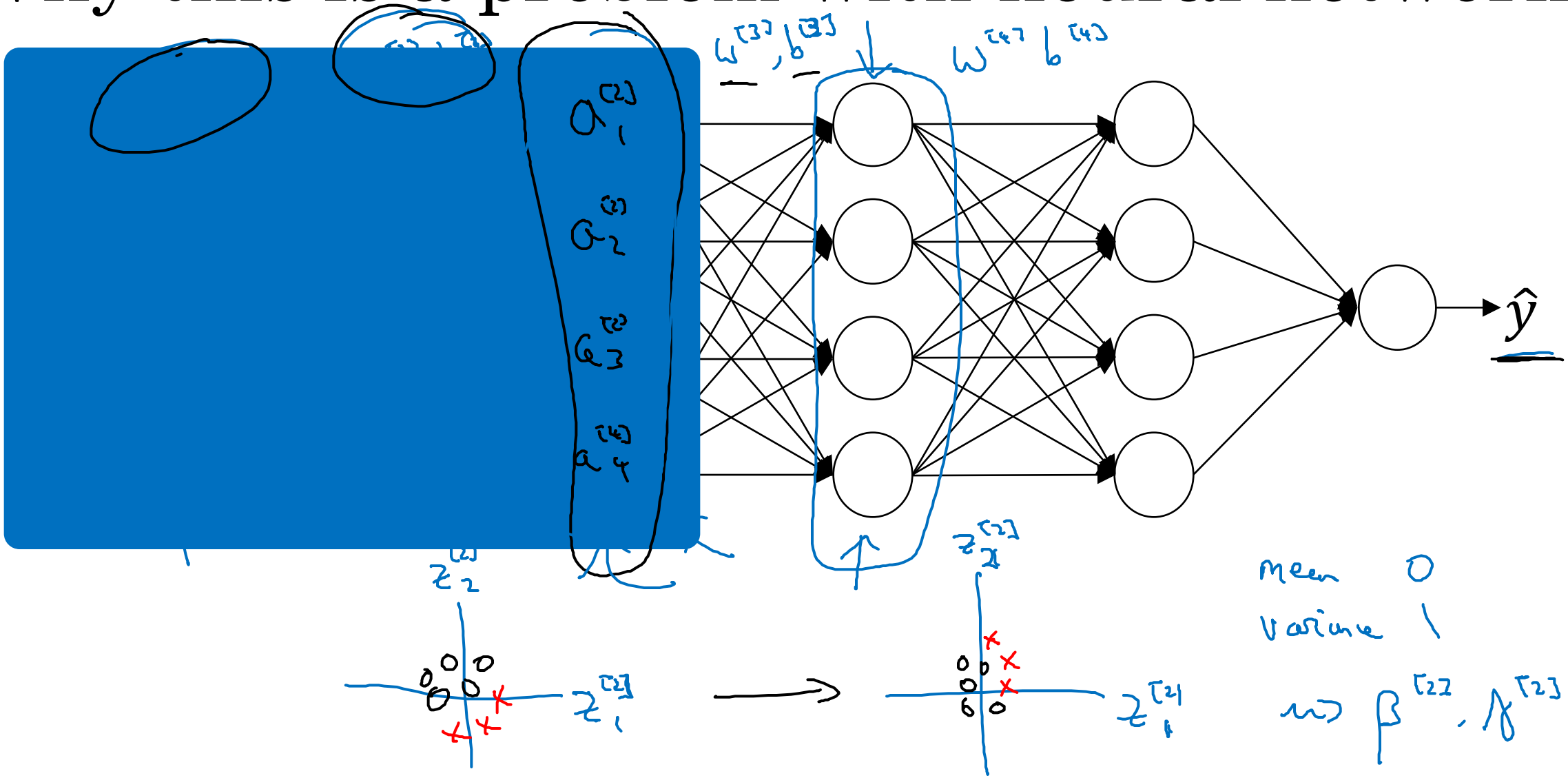
$y = 1$



$y = 0$

Andrew Ng

Why this is a problem with neural networks?



Batch Norm as regularization

- Each mini-batch is scaled by the mean/variance computed on just that mini-batch.
- This adds some noise to the values $z^{[l]}$ within that minibatch. So similar to dropout, it adds some noise to each hidden layer's activations.
- This has a slight regularization effect.