Deep Learning Introduction - 20th Aug

Sunday, August 20, 2023 5:01 PM

Introduction
What Is Deep Learning
ML vs DL Vs AI
Why Deep Learning And Why Now
What is a Neural Network?
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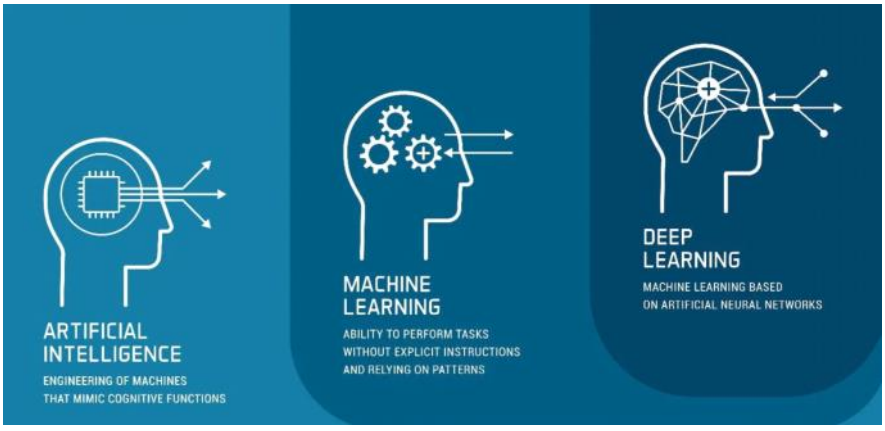
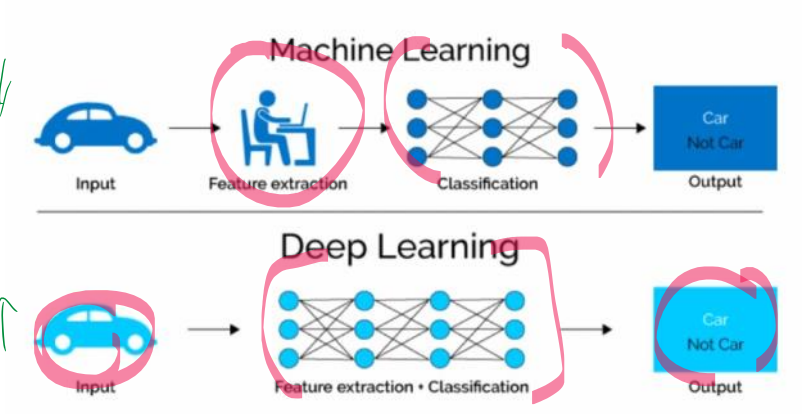
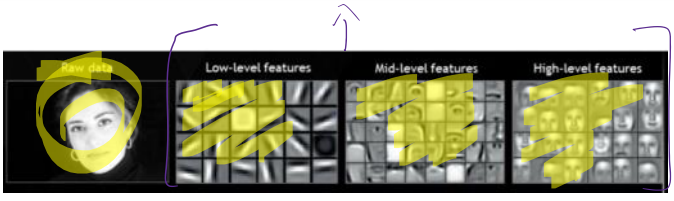
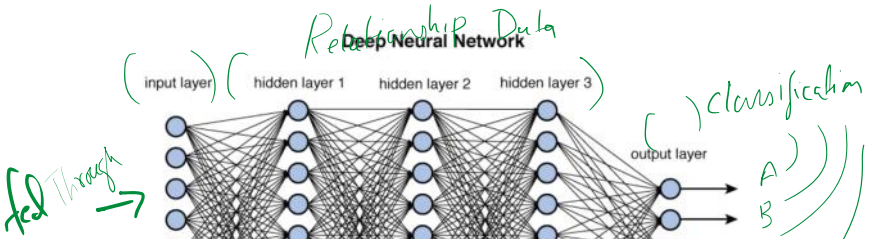
Example 3: NOT
Work Around With TensorFlow Creating Some Tensors
Why multi-layer networks are useful?
Case 1: X1 XNOR X2 = (A'.B') + (A.B)]
General Structure of a Neural Network









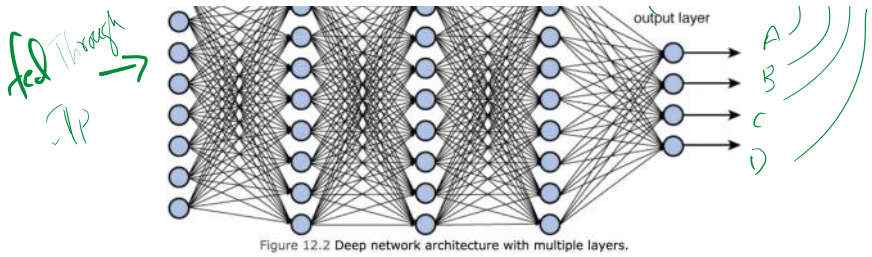
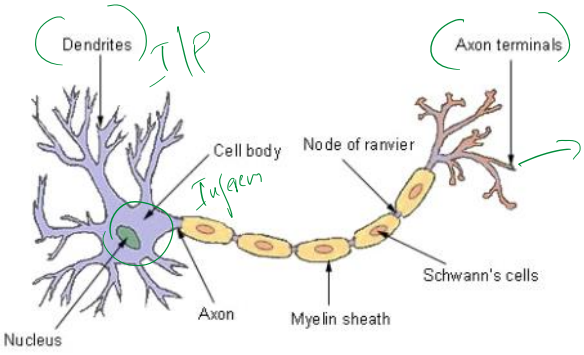
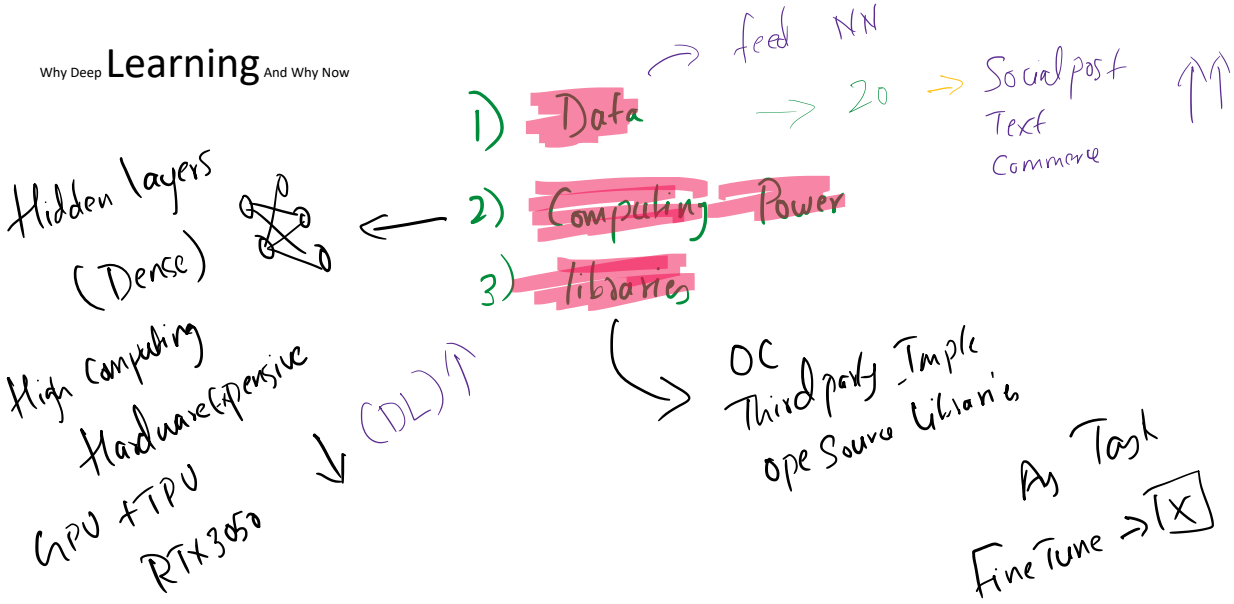
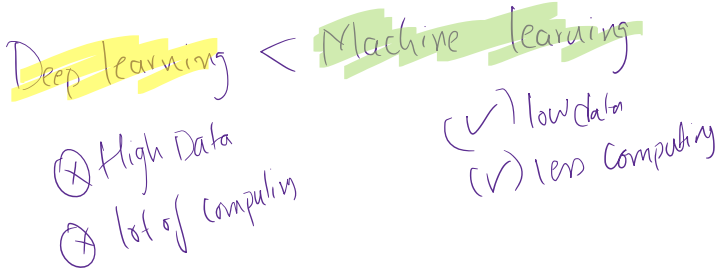


Figure 12.2 Deep network architecture with multiple layers.

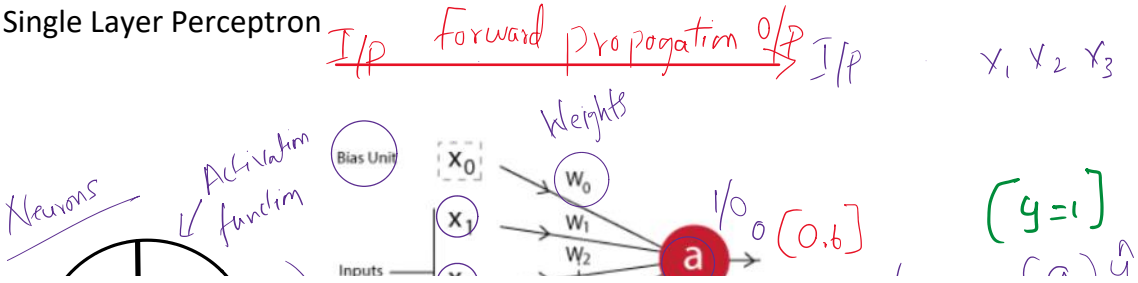


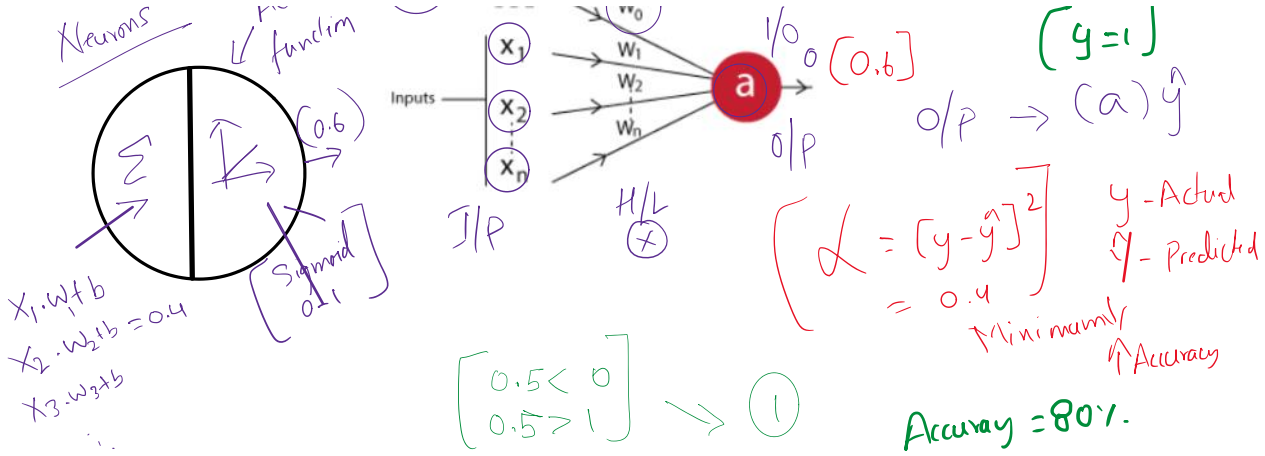
Why Deep Learning And Why Now



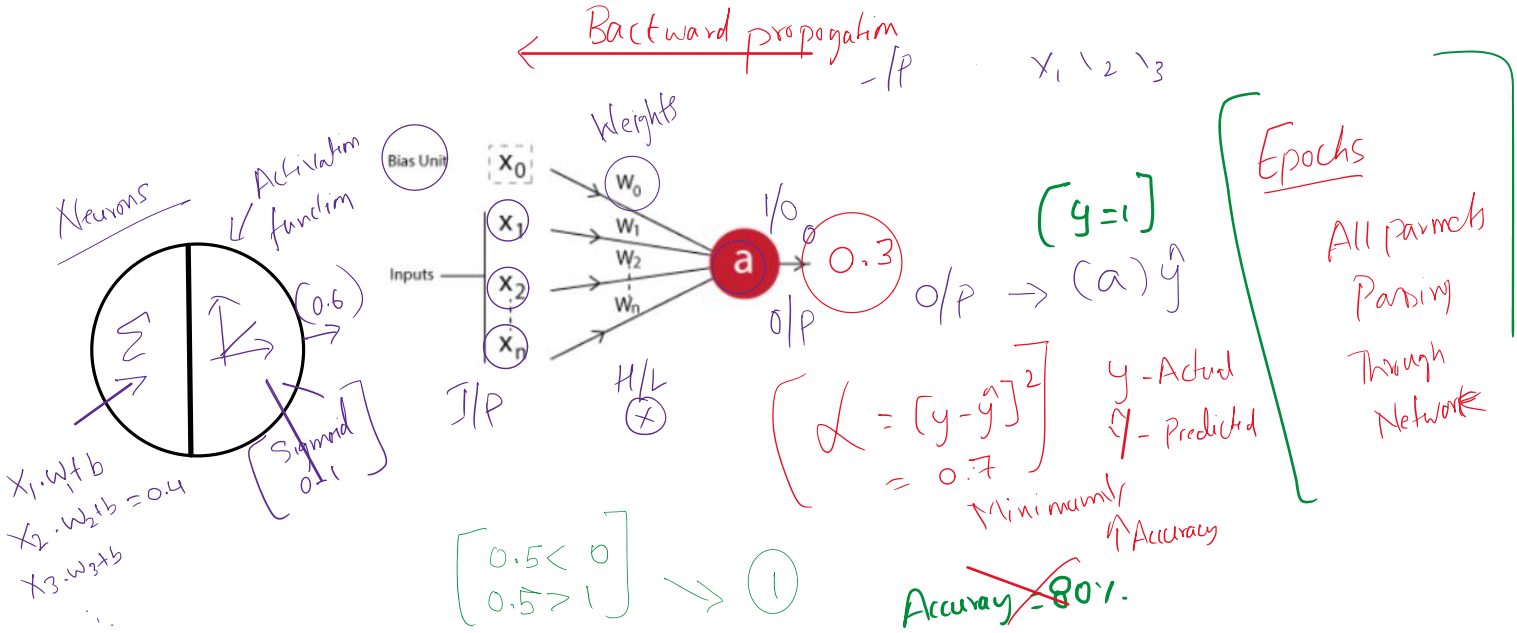


Single Layer Perceptron

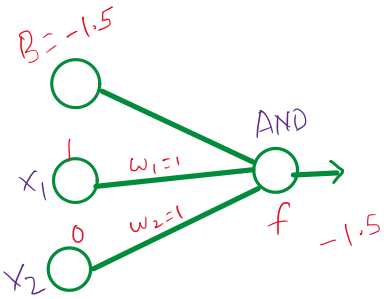




OTher Scenario



Single Layer Network AND Gate



X1	X2	X1 AND X2
0	0	0
0	1	0
1	0	0
1	1	1

Y
$\hat{y}$
0
0
0
1

[0,0] [0,1] [1,0] [1,1]

[0,0]

$y = w_1x_1 + w_2x_2 + b$

$= (1.0) + (1.0) + (-1.5)$

$= 0 + 0 - 1.5$

$= -1.5$

[0,1]

$y = w_1x_1 + w_2x_2 + b$

$= (1.0) + (1.1) + (-1.5)$

$= 0 + 1 - 1.5$

$= -0.5$

[1,0]

$y = w_1x_1 + w_2x_2 + b$

$= (1.0) + (1.1) + (-1.5)$

$= 1 + 0 - 1.5$

$= -0.5$

[1,1]

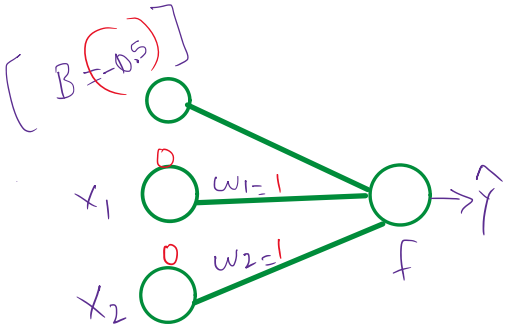
$y = w_1x_1 + w_2x_2 + b$

$= (1.1) + (1.1) + (-1.5)$

$= 1 + 1 - 1.5$

$= 0.5$

Single Layer Network OR Gate

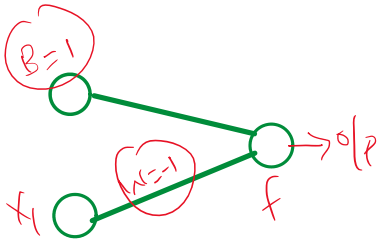


X1	X2	X1 OR X2
0	0	0
0	1	1
1	0	1
1	1	1

-0.5 0.5 0.5 1.5 | Ŷ: 0 1 1 1

$f = w_1x_1 + w_2x_2 + B$

Single Layer Network NOT Gate



Ŷ: 1 0

X1	NOT X1
0	1
1	0

Need Of Multiple Layer Neural Network

X1 XNOR X2 = (A'.B') + (A.B)

$= \text{NOT}[(A+B).(A'+B')]$

X1 XNOR X2 = (A .B) + (A.B)

$= \overline{NOT}\left[(A+B)\cdot(A'+B')\right]$

$= (A+B)' + (A'+B')'$

$= (A'\cdot B') + (A\cdot B)$