

2-3 years back

Tensorflow : 2015-2016



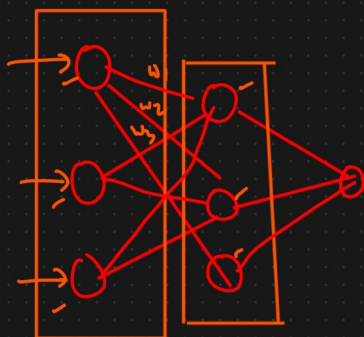
Numpy → ANN → Yes  
Pytorch → Arrays ← Fast

< 2.0

↓  
Super fast

Tensor ⇒ Tensorflow ⇒ Tensors ⇒ Very Fast

Matrix Multiplication ⇒ Very fast



Input layer

Tensorflow 2.0

Google

tf.keras

KERAS

→ library

→ function

Dense (=)

↓ Wrapper

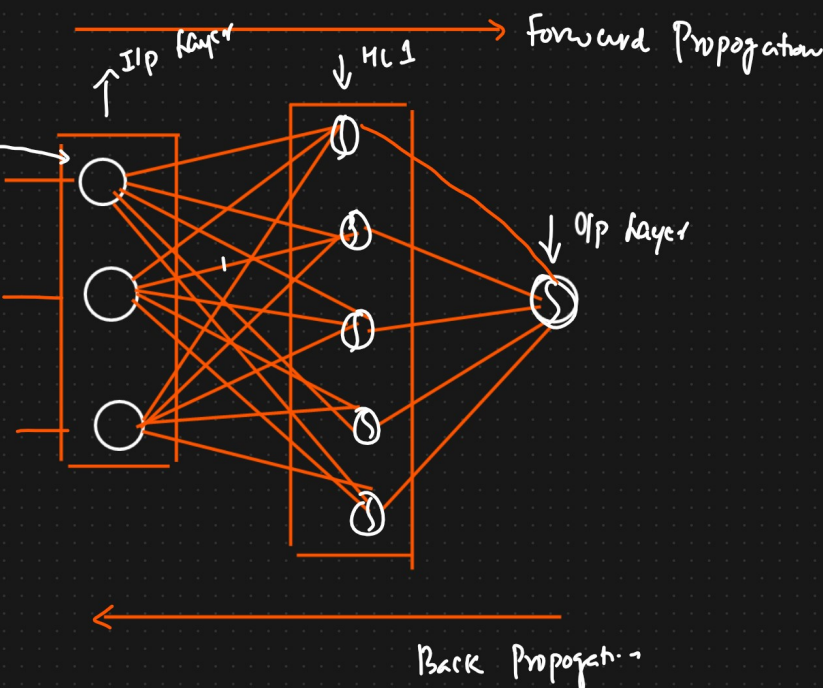
Tensorflow

[tf.constant [inputs]]

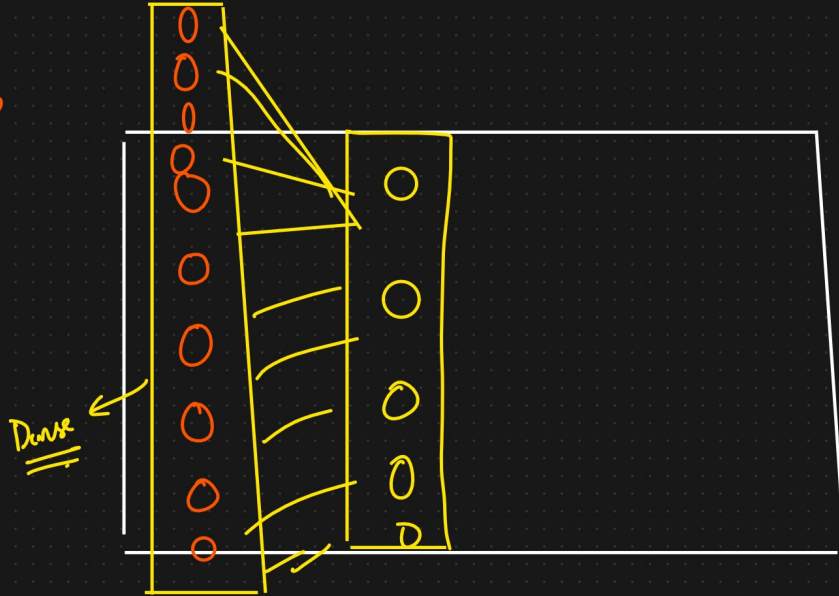
20 lines

↓  
dot of time

- Layers
- ① Dense
  - ② Sequential
  - ③ Activation fn
- =

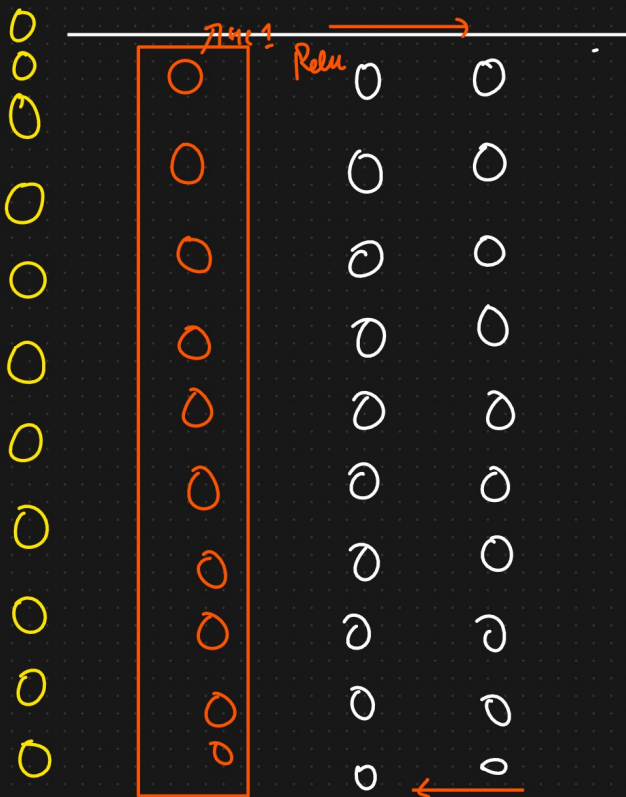


ILP



⇒ Sequential Block.

ILP  
Layer



100 → Epochs

100  
200  
300

Loss ↓

Loss ↓  
Loss ↓  
Loss ↓

Loss ↓



Early Stopping

# Weight Initialization Technique

① Uniform Distribution

$$W_{ij} \sim \text{Uniform} \left[ \frac{-1}{\sqrt{in}}, \frac{1}{\sqrt{in}} \right]$$

→ 0

0

→ 0

0

→ 0

0 → 1

## ② Glorot Uniform

$$w_{ij} \sim U \left[ \frac{-\sqrt{6}}{\sqrt{\text{in} + \text{out}}}, \frac{\sqrt{6}}{\sqrt{\text{in} + \text{out}}} \right]$$

## ④ Glorot Normal

$$w_{ij} \sim N(0, \sigma)$$

$$\sigma = \sqrt{\frac{2}{(\text{input} + \text{output})}}$$

## ① He initializer

## ④ He Normal

## ② He Uniform

1000 Records



33%

Validation

670

330 rec

Epoch 1 :  $670 / 10 = 67$

→ 67

Iteration 1

←

Iteration 10

TRAINING



Tensorflow

→ Training loss

→ Validation loss

→

8000 Records

33%

→ ~~2400~~

2640

Epochs = 100

batch-size = 10

10 → 20%

100 → 20%

Model overfitting

Hyperparameter

20% ✓

536

→

20% ✓

DROP OUT

post pruning & pre pruning

Decision Tree Depth

Drop  
out



Epoch



Deactivated



Does not

Overfit

Regularization

Does not  
overfit

$L_1$  and  $L_2$

$L_1$  and  $L_2$

