

LEARNING ML/DL  
FROM UNIVERSITY

ONLINE COURSES

FROM YOUTUBE

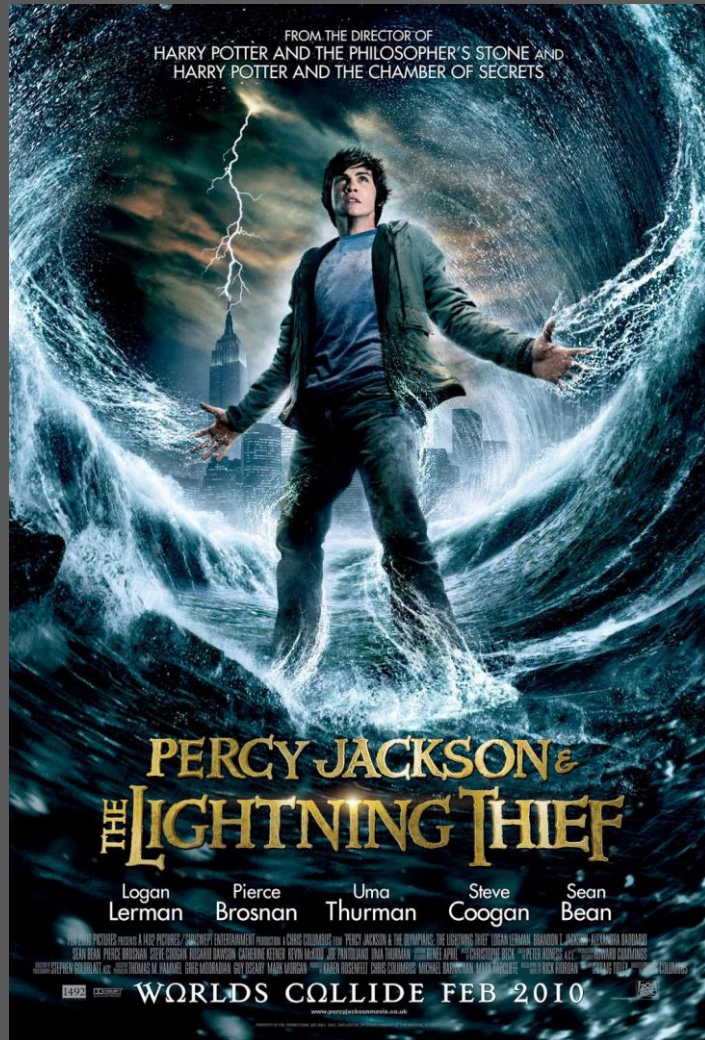
FROM ARTICLES

FROM MEMES

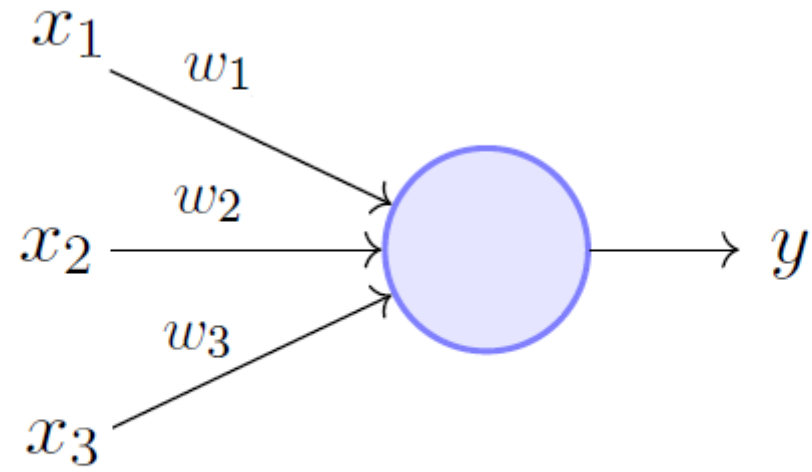


Discussion  
Singin' in the Rain





Percy-eptron



Perceptron Model (Minsky-Papert in 1969)

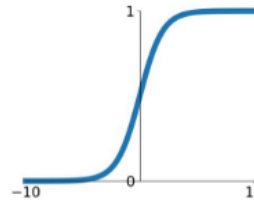


# (BI)ac(k)-tivation Functions

## Activation Functions

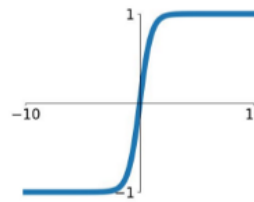
**Sigmoid**

$$\sigma(x) = \frac{1}{1+e^{-x}}$$



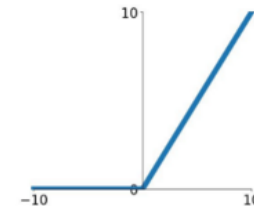
**tanh**

$$\tanh(x)$$



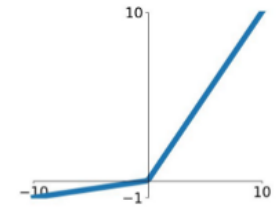
**ReLU**

$$\max(0, x)$$



**Leaky ReLU**

$$\max(0.1x, x)$$

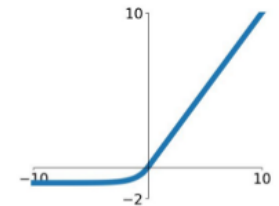


**Maxout**

$$\max(w_1^T x + b_1, w_2^T x + b_2)$$

**ELU**

$$\begin{cases} x & x \geq 0 \\ \alpha(e^x - 1) & x < 0 \end{cases}$$





# Let's work on an X-ample



# (A) New (Hope) Rail Network



TWENTIETH CENTURY-FOX Presents A LUCASFILM LTD. PRODUCTION **STAR WARS**  
Starring **MARK HAMILL HARRISON FORD CARRIE FISHER**  
**PETER CUSHING**  
and  
**ALEC GUINNESS**

Written and Directed by **GEORGE LUCAS** Produced by **GARY KURTZ** Music by **JOHN WILLIAMS**

**STAR WARS**

Making Films Sound Better  
**DOLBY SYSTEM**  
Noise Reduction - High Fidelity

PANAVISION® PRINTS BY DE LUXE® TECHNICOLOR®

Original Motion Picture Soundtrack on 20th Century Records and Tapes



Long Definition (optional):

Artificial neural networks, usually simply called neural networks (NNs), are based on a collection of connected units or nodes called artificial neurons, which loosely model the neurons in a biological brain. Each connection, like the synapses in a biological brain, can transmit a signal to other neurons. An artificial neuron that receives a signal then processes it and can signal neurons connected to it.

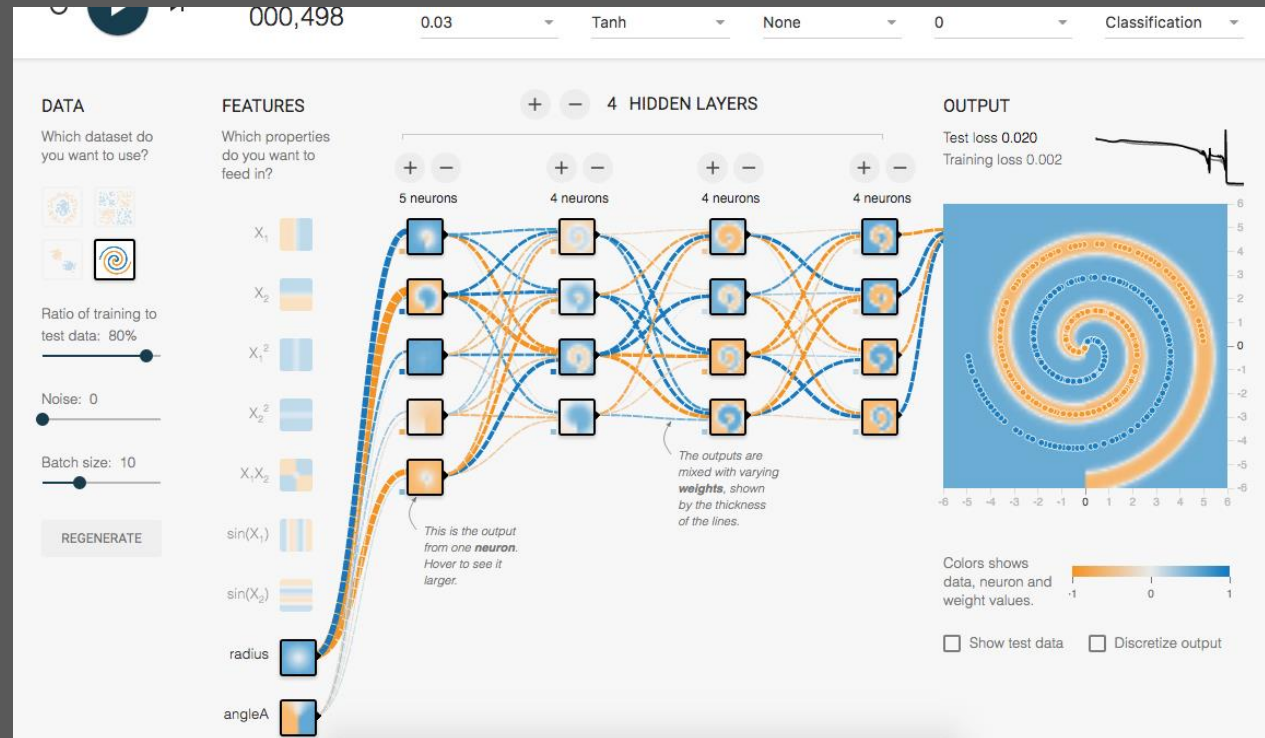
**Short Definition:**

**Neural Network is a bunch of perceptron connected together**

# Motivation:

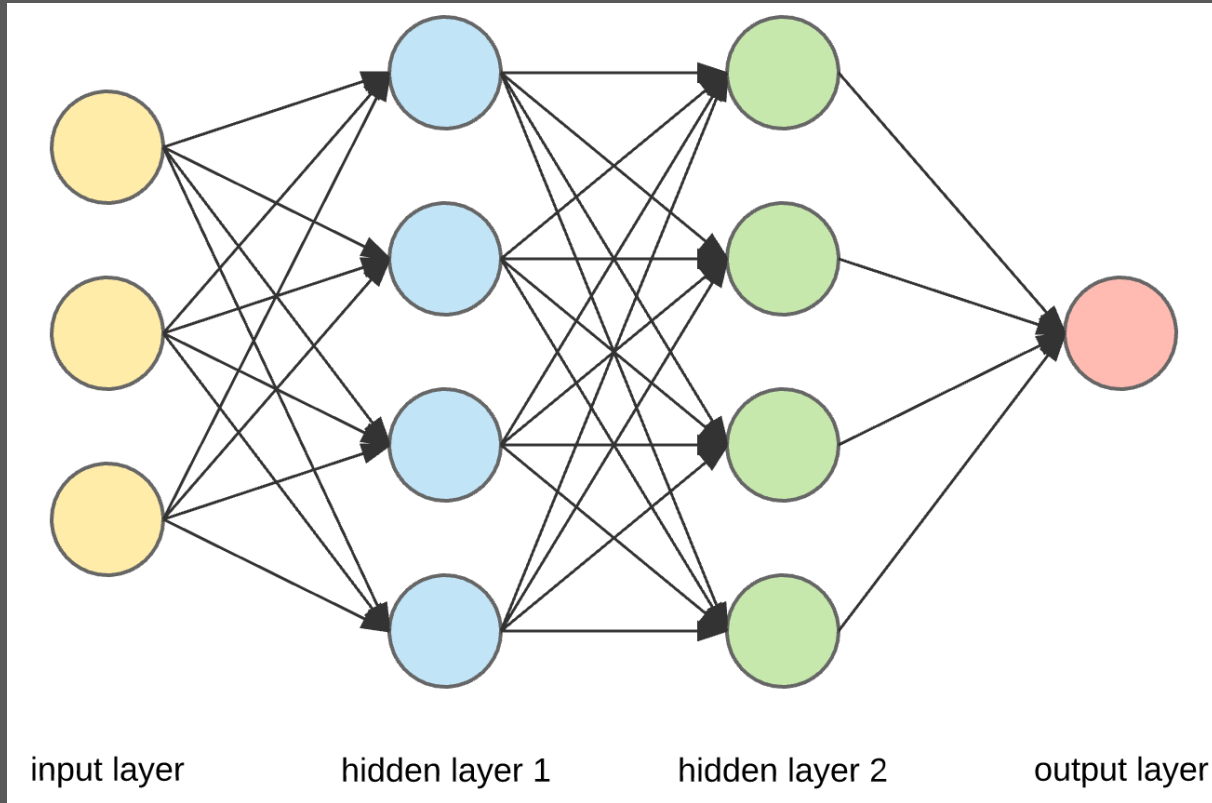
The perceptron is not complex enough to classify non-linear data. We then introduced neural network which consists of many perceptron to handle non-linear classification problem.

<https://playground.tensorflow.org/>



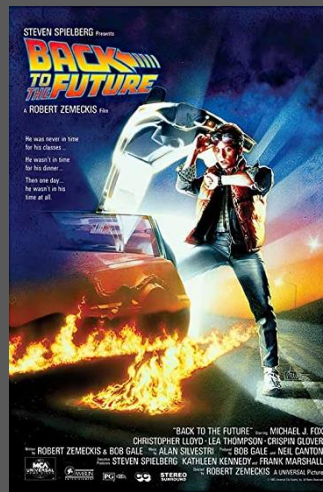


# Definition & Terminology

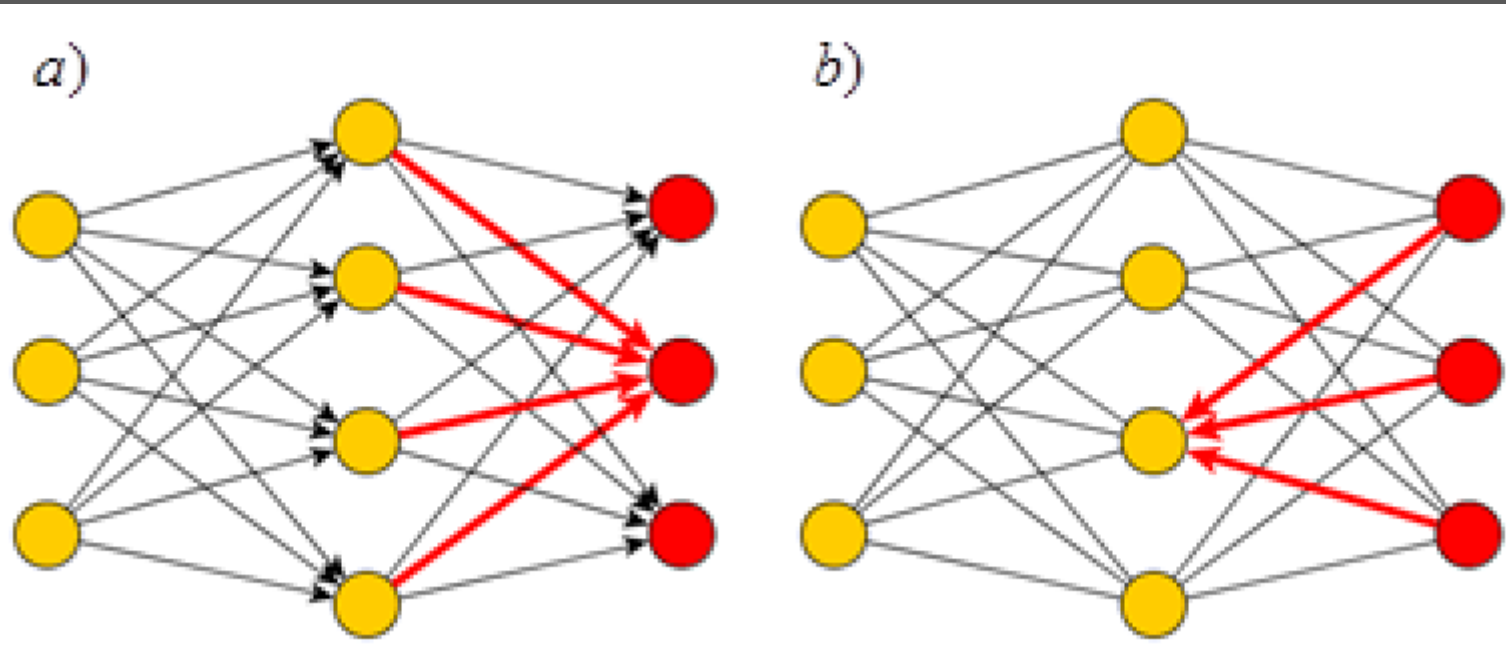


(Demon S)Layers





# Back Propagation (backpropagation)





(Django Un)chain(ed) rule is  
backpropagation backbone

That's The End (of Evangelion) for today

