

#DEEPMLEARNINGJOURNEY

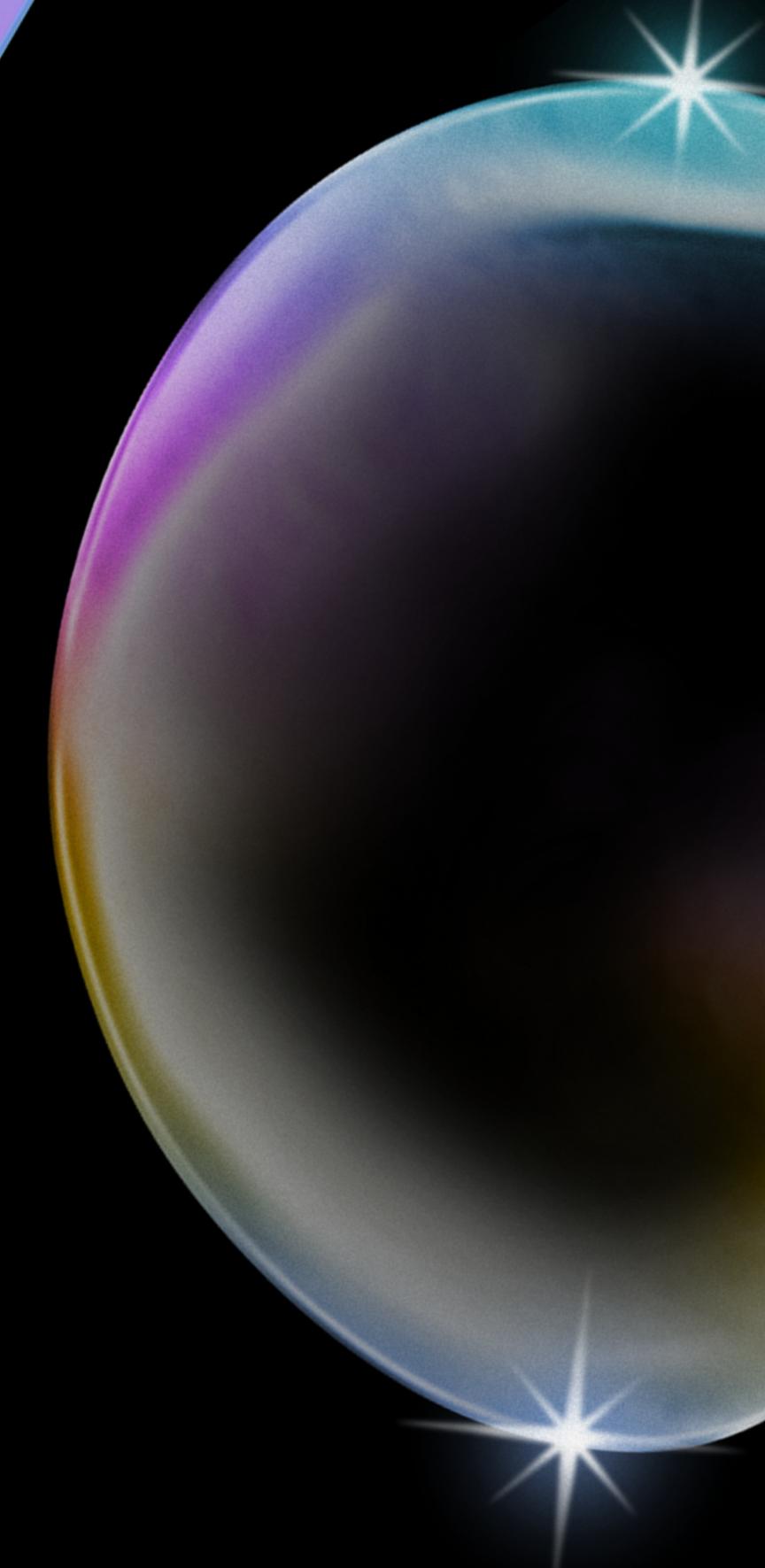
INTRO TO DL & NEURAL NETWORK

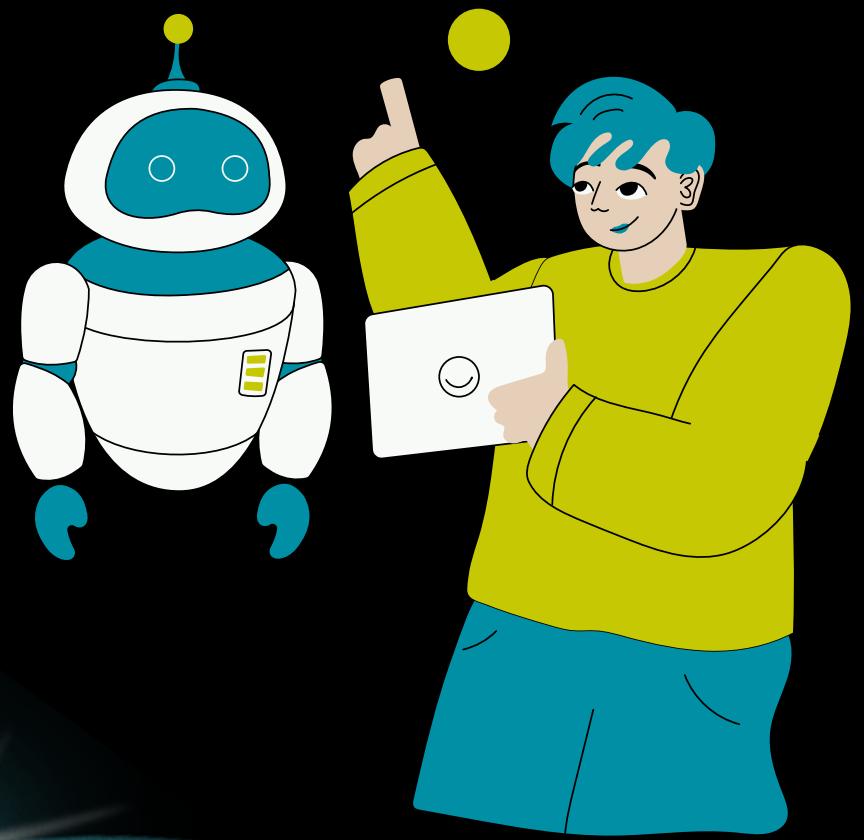
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Before we start...

SPOTLIGHTING TODAY'S THEME

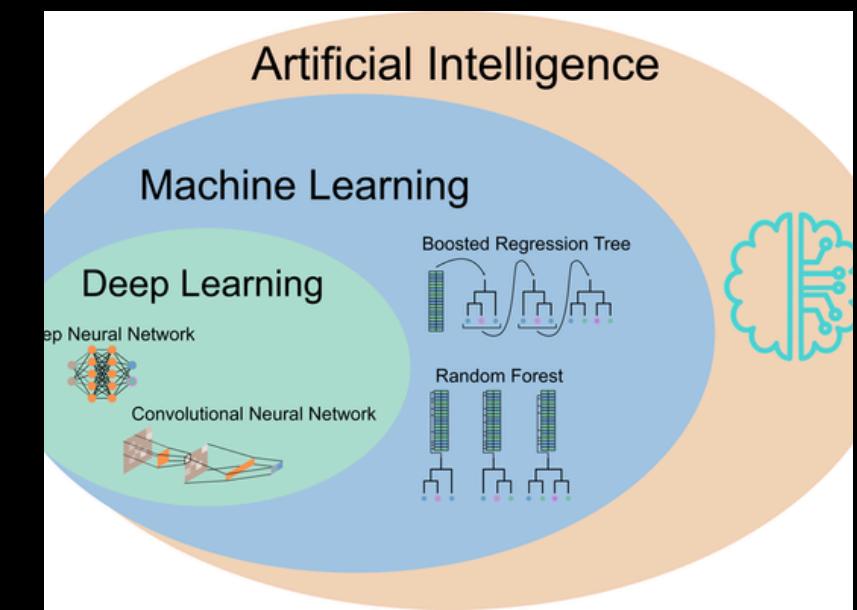
- 1 What is Deep Learning?
- 2 ML Vs. DL
- 3 The Perceptron.
- 4 Multilayer Perceptron.
- 5 Activation function and its types





DEEP LEARNING!

Deep learning is an advanced AI technique that uses deep neural networks to process large amounts of data, inspired by the human brain's ability to learn and recognize complex patterns.



What makes DL different from ML?

Machine Learning

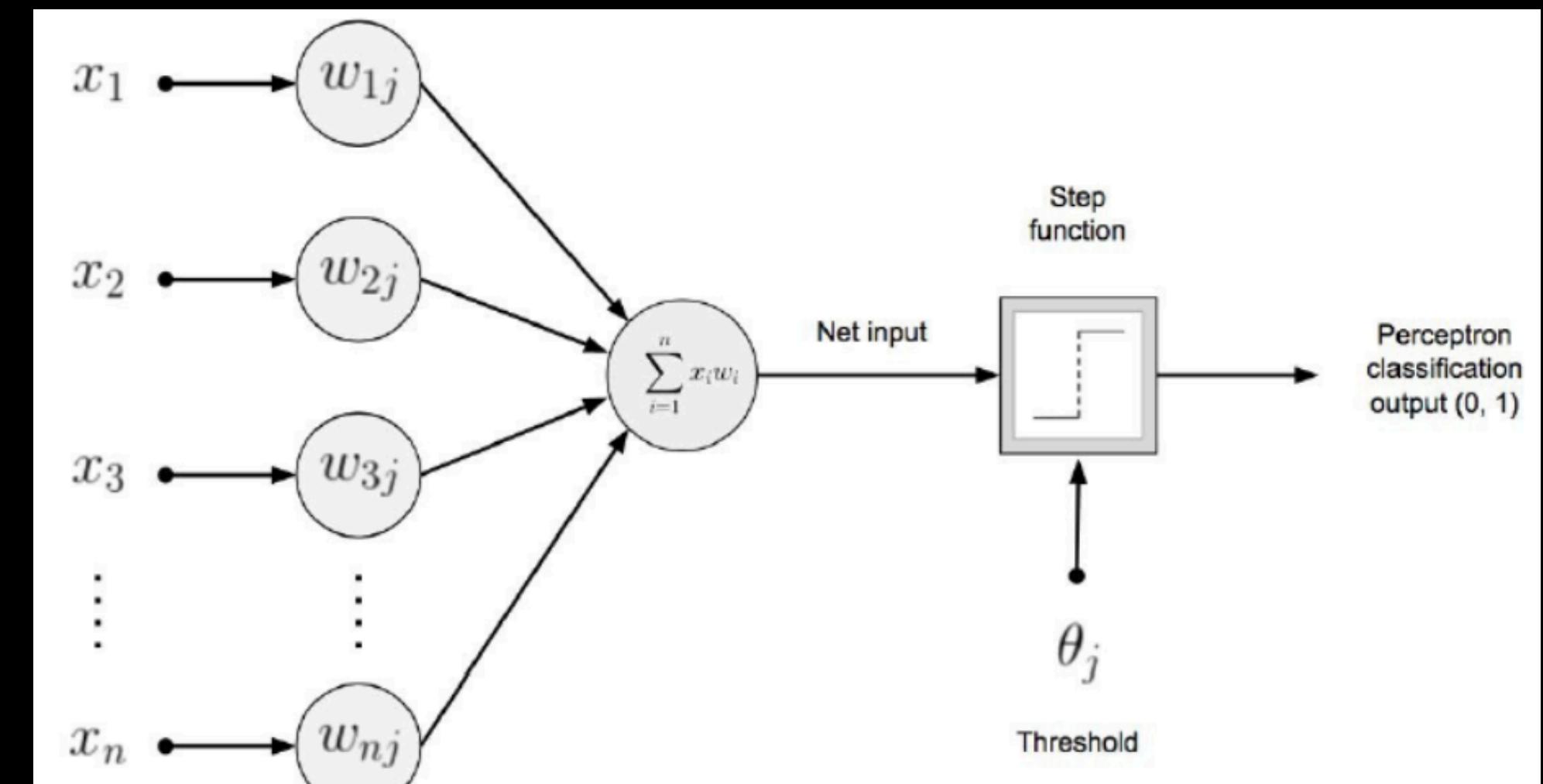
- Works with smaller datasets.
- Good for simple tasks.
- Faster training.
- Easier to understand results.
- Needs manual feature selection.

Deep Learning

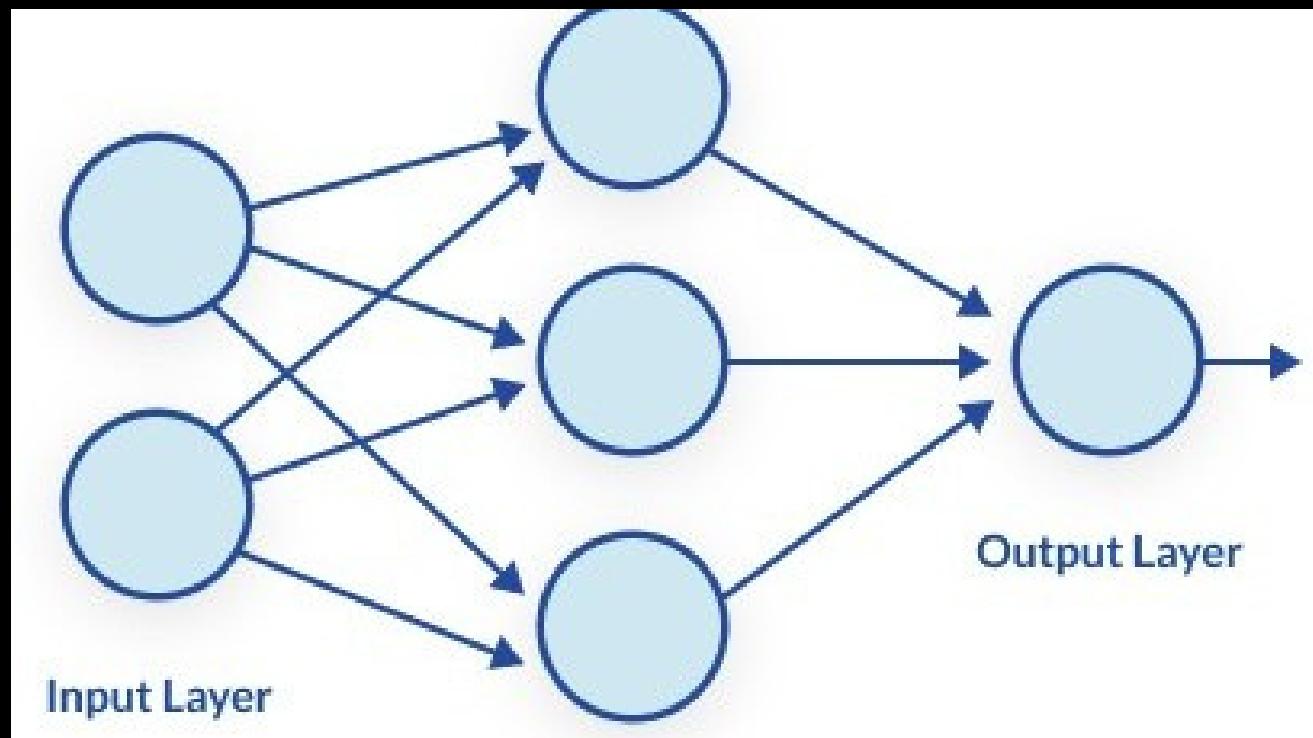
- Needs large datasets.
- Good for complex tasks
- Slower training.
- Harder to interpret results.
- Automatically finds important features.

Perceptron

A perceptron is a simple neural network model used for binary classification that calculates a weighted sum of inputs & passes it through a activation Function to produce binary output



Multilayer Perceptron



MLP is an Advanced Perceptron consists of Input layer , multiple hidden layers and output layers to solve complex problems.

Unlike a Single-layer perceptron MLP can relationships by using non-linear Activation Function.

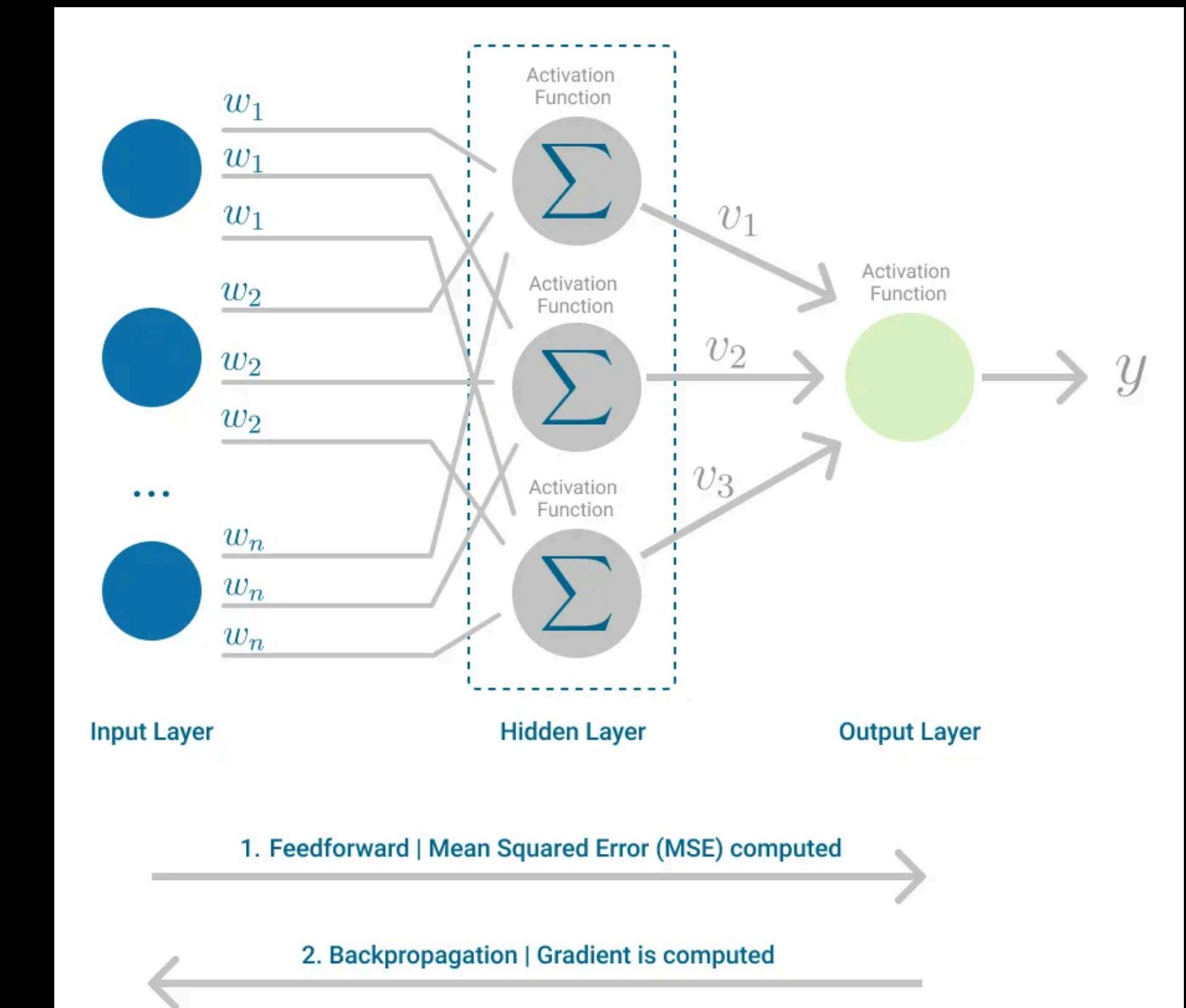
MLP with feedback

The FeedForward algorithm in neural networks involves -

Forward Propagation: Where data flows from input to output through weighted layers this goes all the way through the hidden layers to the output layer.

& For carrying out the learning-

Backpropagation: Where errors are propagated to adjust the weights for improved predictions



Imp Notations

- L - Number of layers
- n_l - Number of neurons in layer l
- W^l - Weight
- b^l - Bias
- z_j^l - Weighted sum for neuron j
- a_j^l - Activation of neuron j in layer l
- σ - Activation function (e.g., ReLU, sigmoid)

ACTIVATION FUNCTION: NEED



- Introduce non-linearity
- Enable learning of complex patterns
- Control the output
- Biological Plausibility

Activation function: Types

Step Function

Sign Function

Linear function

Hyperbolic (Tanh)

Sigmoid Function

Softmax Function

Rectified Linear unit (ReLU)



Thankyou For listening!



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