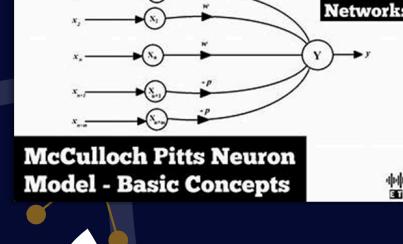


Evolution of Neural Network

From Biological Inspiration to Deep Learning

1943 - McCulloch & Pitts

- Scientists proposed the idea of neural network
- Modeled neurons using logic gates
- Showed even simple binary operation can be represented by network of neurons



McCulloch Pitts Neuron Model - Basic Concepts

1957

- Trainable neural network called Perceptron

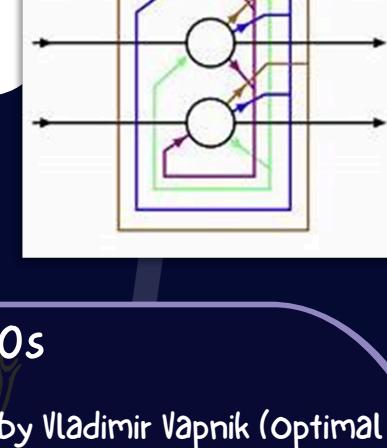
• Introduced weights and summation

• Binary Classification

• Solve Linearly separable problems

1980s

- Researchers developed MLP (More than 1 layer)
- 1982 - Hopfield recurrent Network (associative memory system)
- 1985 - Geoffrey and Terry developed Boltzmann machines (Stochastic recurrent neural network)
- 1986 - Introduction Backpropagation to train multilayer network by updating weights using gradient descent algorithm



1990s

- SVM was developed by Vladimir Vapnik (optimal hyperplane separating classes with maximum margin)
- 1997 - Introduction of LSTM by Stepp & Jürgen (design to remember information over long sequence)
- 1999 - GPU was introduced (processing of large matrix data)

2000s

- 2012 - AlexNet won the ImageNet challenge, popularizing Convolutional Neural Networks (CNNs).
- Post 2012 - TensorFlow, PyTorch
- Large datasets + better hardware led to DNN (Deep Neural Network)

