EVOLUTION OF DEEP LEARNING

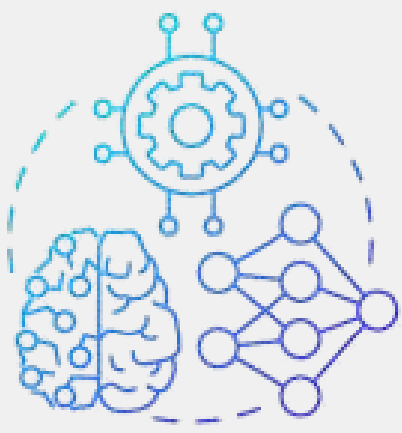
1943-1960

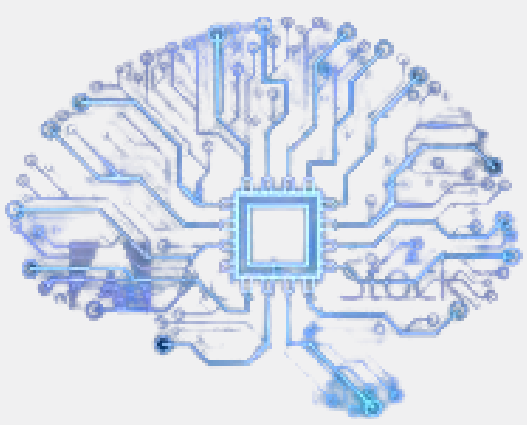
Foundation of Neural Networks

1943 : Threshold Logic Unit
Warren McCulloch & Walter Pitts proposed the first neuron model.

1958 : Perceptron
Frank Rosenblatt designed the first trainable neural network.

1960 : Adaline
Widrow & Hoff created an early adaptive model using linear neurons.





1969

First Neural Winter Trigger

XOR Problem

- Minsky & Papert proved single-layer perceptrons can't solve XOR.
- Funding and interest in neural networks declined.

1982-1987

Rise of Deep Learning Concepts

1982 : Multilayer Perceptrons
Introduced deeper networks with hidden layers.

1986 : Backpropagation Algorithm
Rumelhart, Hinton, Williams made training feasible.

1989 : CNNs (LeNet)
Yann LeCun applied CNNs to digit recognition.

1997 : LSTM (Long Short-Term Memory)
Hochreiter & Schmidhuber improved RNNs for long-sequence learning.

1995-2005

Second Neural Winter & Pre-Deep Learning Era

1995 : Support Vector Machines (SVMs)
Dominated machine learning due to better generalization.

2006: Deep Belief Networks
Geoffrey Hinton reintroduced deep networks via layer-wise pretraining.

2012-2017

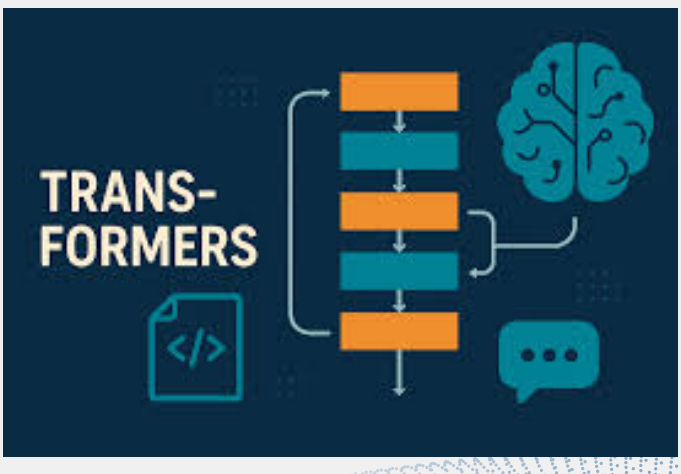
Deep Learning Revolution

2012: AlexNet + GPUs
Krizhevsky, Hinton, Sutskever achieved breakthrough on ImageNet.

2014 : GANs
Ian Goodfellow introduced a new way to generate data.

2015 : ResNet
Enabled training of ultra-deep networks via skip connections.

2017 : Transformers
"Attention is All You Need" revolutionized NLP.



2018-Present

Foundation Models & Multimodal AI

2018-2024:
BERT, GPT-2/3/4, DALL·E, CLIP, Whisper, SAM, Sora
Companies: OpenAI, Google, Meta, Anthropic

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