Setting the Stage: Why Perceptron? Why Deep Networks?

- Perceptron solves AND, OR gates
- Cannot solve XOR — needs curved boundaries
- Multilayer Perceptrons solve XOR
- Neural Networks break complex problems into simpler steps

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Demo Time!

- Perceptron App Demo
- Train tiny brain
- Watch learning happen!
- What is really happening inside?



The Birth of the Perceptron

- 1958: Frank Rosenblatt
- First pattern recognizing machine
- Inputs → Weights → Bias → Activation → Output

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How a Perceptron Works

- Multiply inputs by weights
- Add bias
- Apply activation (Step)
- Output 0 or 1

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The Limitation: XOR Problem

- XOR can't be solved with a straight line
- Single Perceptron fails
- Need multiple regions of decision



Multilayer Perceptrons (MLP) to the Rescue

- Hidden layers split problem
- Combine simple regions smartly
- XOR now solved!

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The Rise of Deep Neural Networks

- Stacking many layers
- Recognize digits, speech, images
- Smarter neural networks

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Special Networks: CNNs, RNNs, LSTMs

- CNNs: Vision
- RNNs: Sequences
- LSTMs: Memory over time



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Transformers: A Giant Leap

- 2017: Attention is All You Need
- Learn faster by focusing on important parts
- Huge breakthrough



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From Transformers to LLMs

- GPT, Claude, Gemini, Llama, Deepseek!
- Understand, generate, reason
- Revolution in AI capabilities



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What's Inside an LLM?

- Millions of artificial neurons
- Attention + Deep stacking
- Core behavior = tiny Perceptrons

Final Reflection

- From one neuron to AI giants
- Layer by layer, dream by dream
- Small beginnings change the world

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