General AI/ML

Unit 1: Intro to AI, ML and DL

1.2.1

Introduction to Deep Learning

What is Deep Learning?

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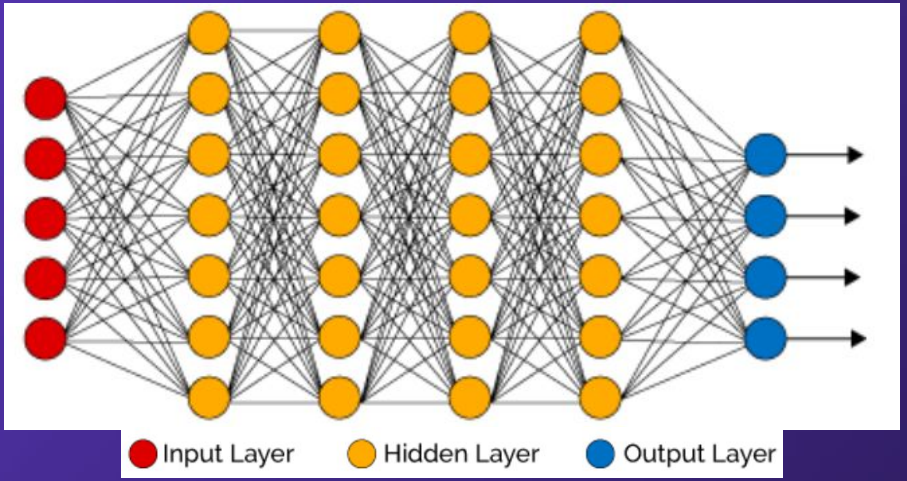
What is Deep Learning?

- A subset of machine learning
- Utilizes artificial neural networks with multiple layers
- Inspired by the structure and function of the brain



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History of Deep Learning and Milestones

Perceptron
1958

Backpropagation
1974

RNN
1986

Imagenet
2006

Transformers
2017

BERT
2018

ChatGPT
2022

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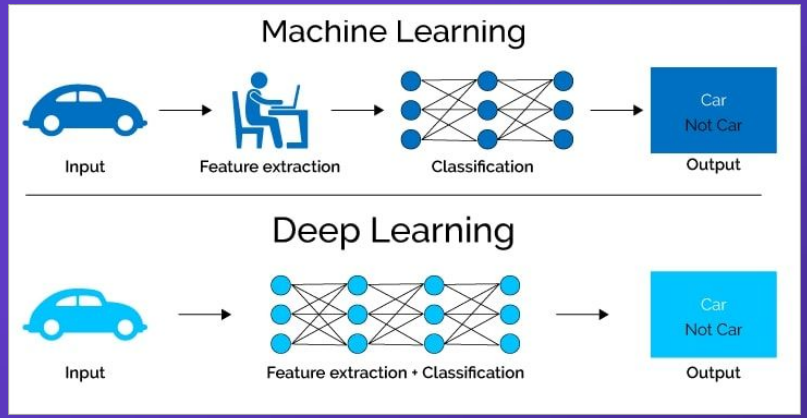
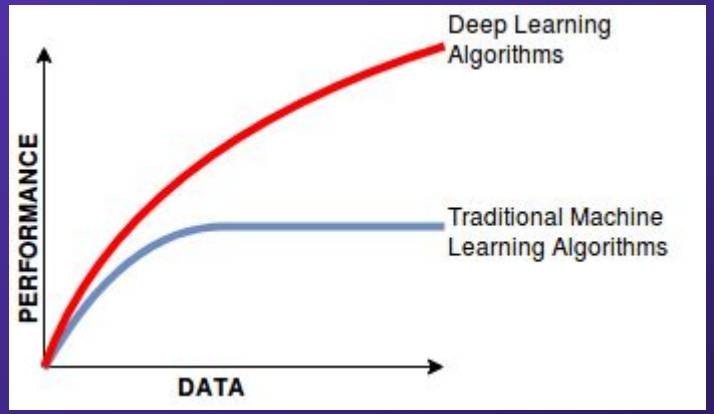
Why Deep Learning?





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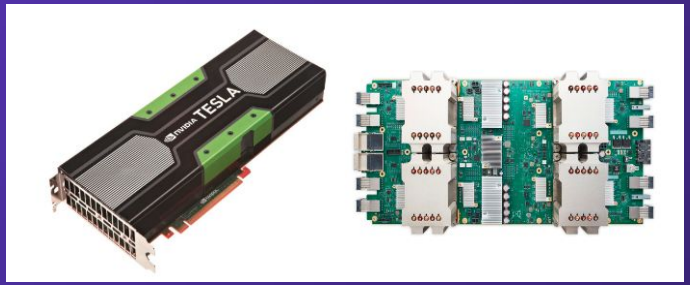
Why is Deep Learning Booming?

- Better algorithms & understanding
- Computing power (GPUs, TPUs, etc.)
- Data with labels
- Open source tools and models



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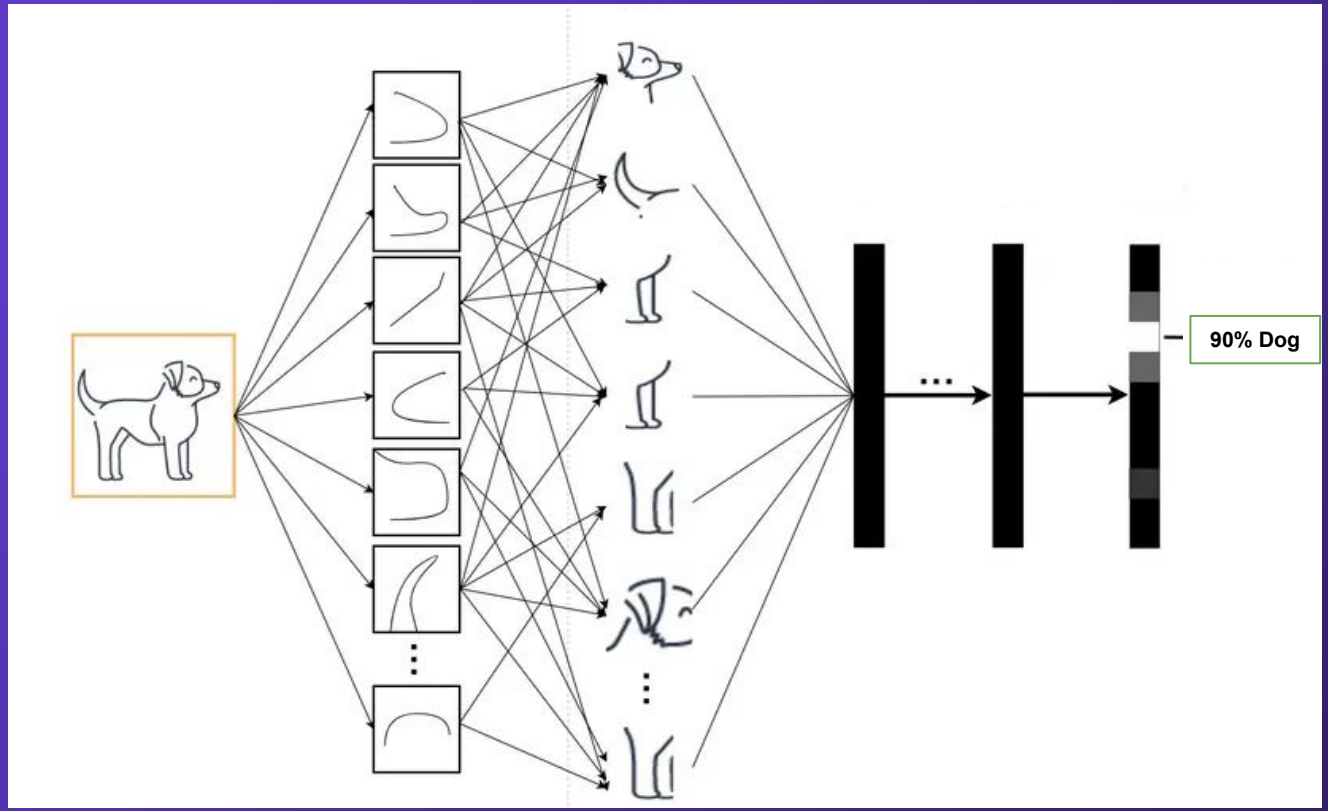
How Deep Learning Works



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Challenges of Deep Learning

- **Data requirements:** Reliance on large datasets can limit application in data-poor scenarios
- **Computational costs:** Training models require significant computational resources
- **Ethical considerations:** Issues like bias in data and privacy concerns must be managed carefully.

Future Outlook

- Research to consumer products
- Deeper models, requiring less data
- More complex network architectures
  - Tackling harder problems in NLP, image, audio, video processing
- The promise of quantum computing

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