What is Deep Learning?

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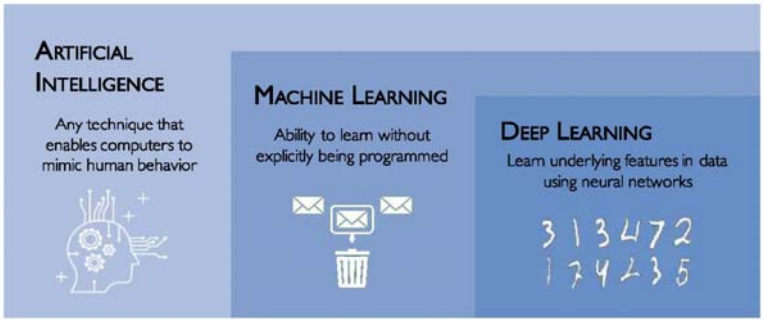

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Deep Learning Success: Vision

Image Recognition

3

Deep Learning Success: Vision

Detect pneumothorax in real X-Ray scans

4

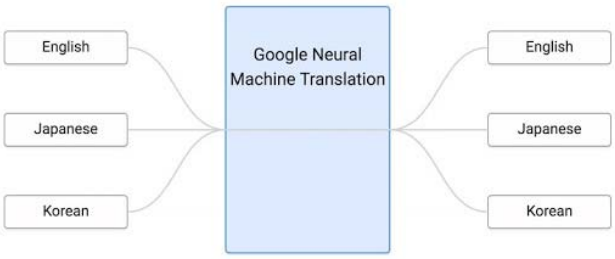
Deep Learning Success: Audio

Music Generation

5

Deep Learning Success: **Machine Translation**

Training



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Deep Learning Success

And so many more…

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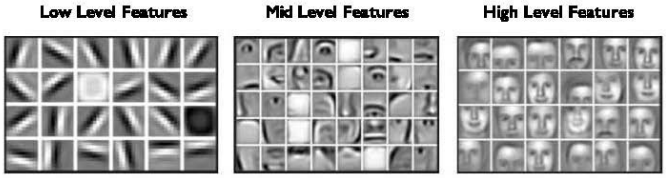
Why Deep Learning?

Hand engineered features are time consuming, brittle and not scalable in practice

Can we learn the **underlying features** directly from data?



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Why Now?

1952 Stochastic Gradient Descent

1958 Perceptron
- Learnable Weights

1986 Backpropagation
- Multi-Layer Perceptron

1995 Deep Convolutional NN
- Digit Recognition

Neural Networks date back decades, so why the resurgence?

1. Big Data
- Larger Datasets
- Easier Collection & Storage

IMAGENET

2. Hardware
- Graphics Processing Units (GPUs)
- Massively Parallelizable

3. Software
- Improved Techniques
- New Models
- Toolboxes

TensorFlow

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