Plan:

1. Explain what a neural net is
2. Understand when NNs are a good approach

Machine Learning: DL& Neural Nets

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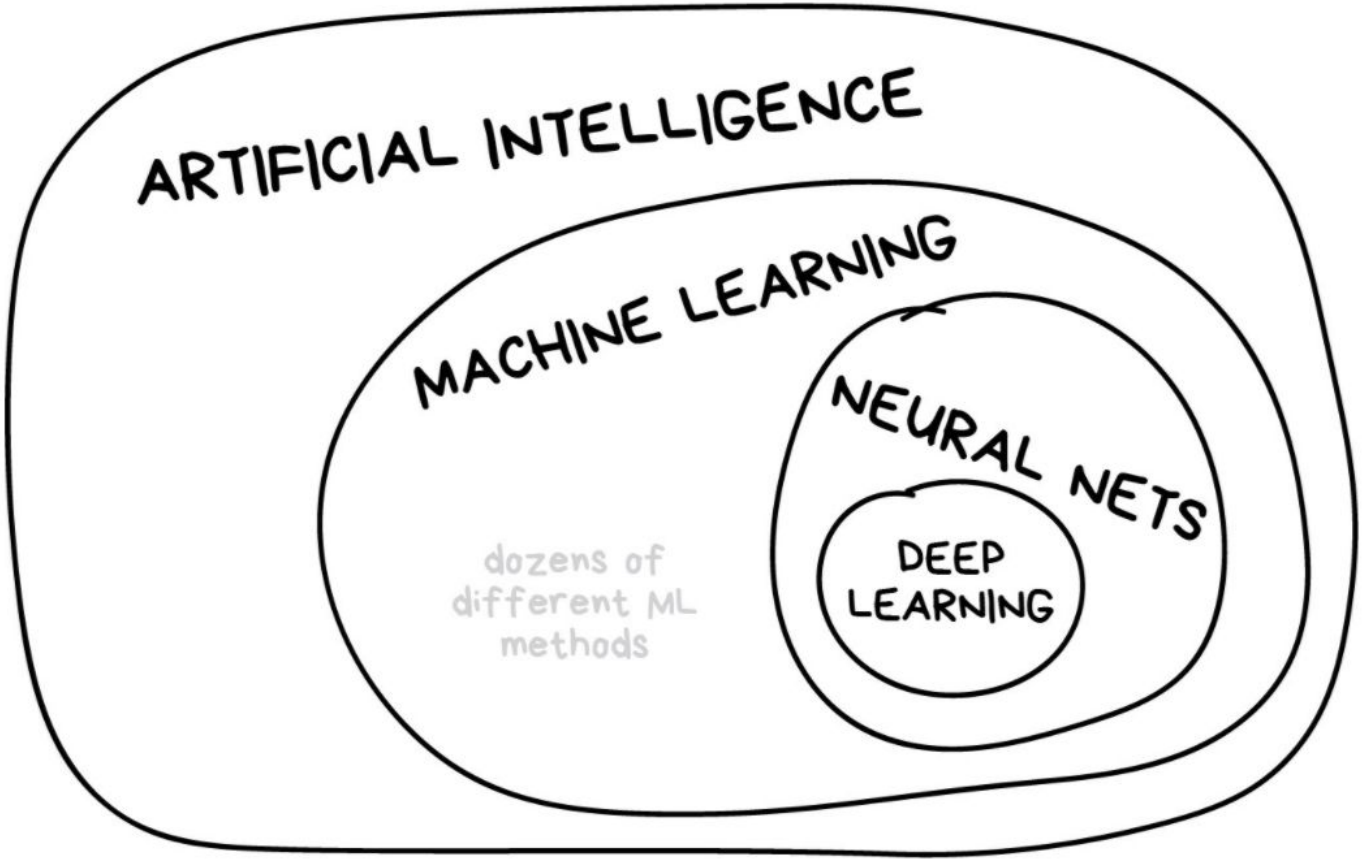


Image source: https://vas3k.com/blog/machine_learning/

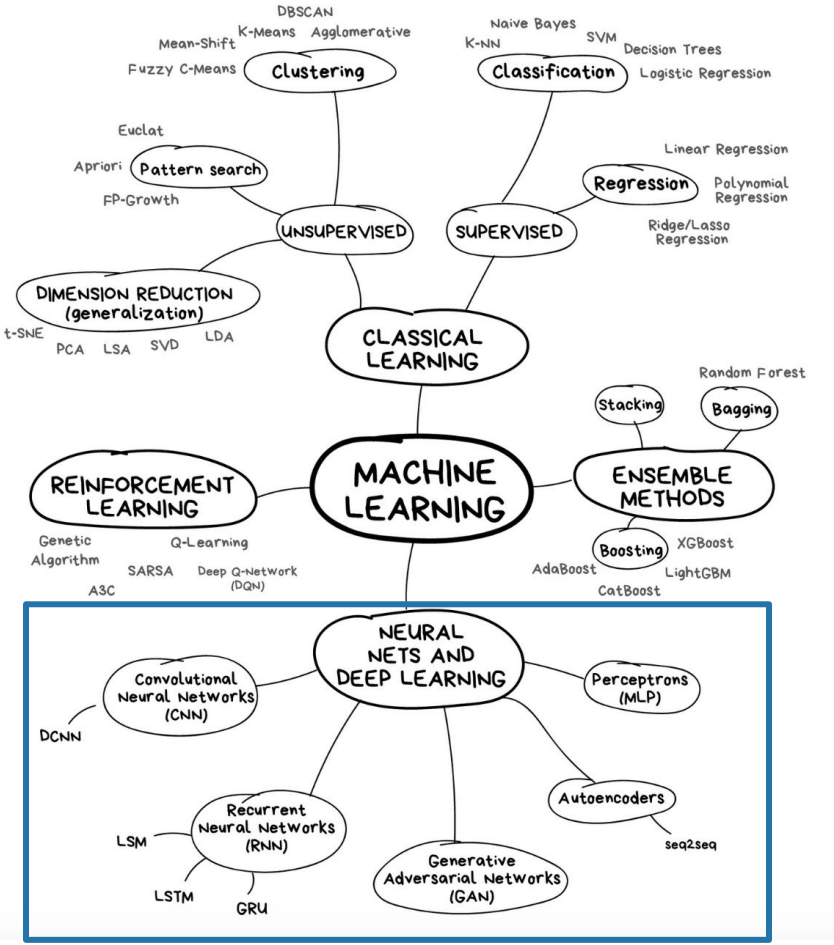
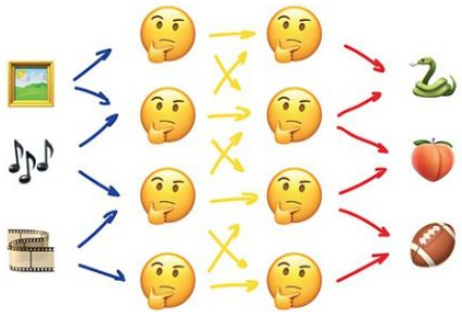


Image source: https://vas3k.com/blog/machine_learning/

"We have a thousand-layer network, dozens of video cards, but still no idea where to use it. Let's generate cat pics!"

Used today for:

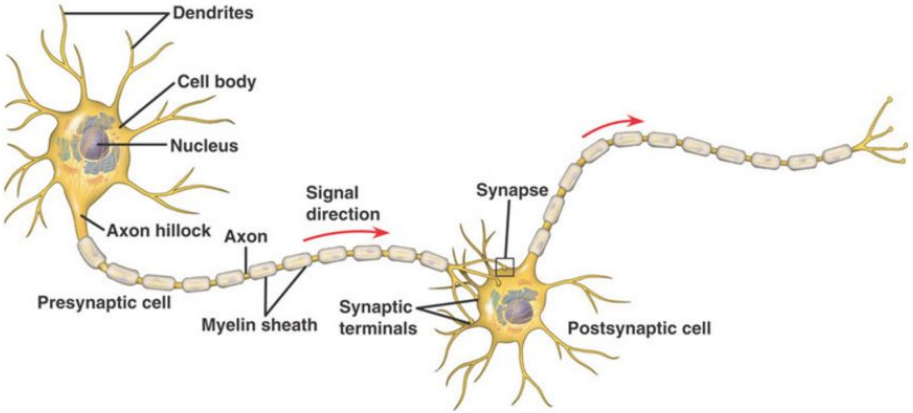
- Replacement of all algorithms above
- Object identification on photos and videos
- Speech recognition and synthesis
- Image processing, style transfer
- Machine translation



Popular architectures: Perceptron, Convolutional Network (CNN), Recurrent Networks (RNN), Autoencoders

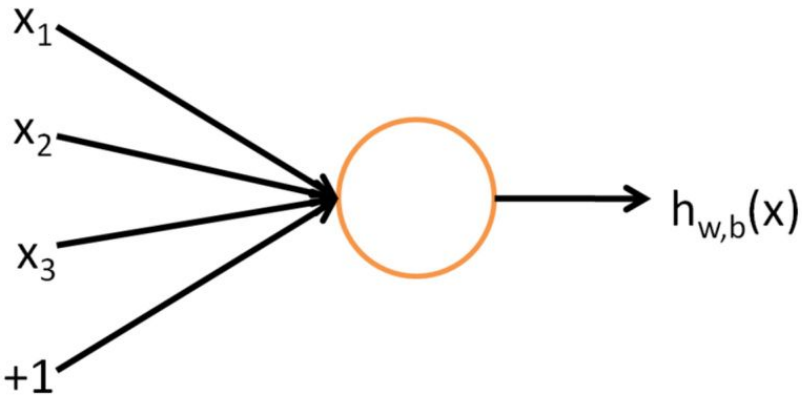
Image source: https://vas3k.com/blog/machine_learning/

WHAT IS A NEURON?



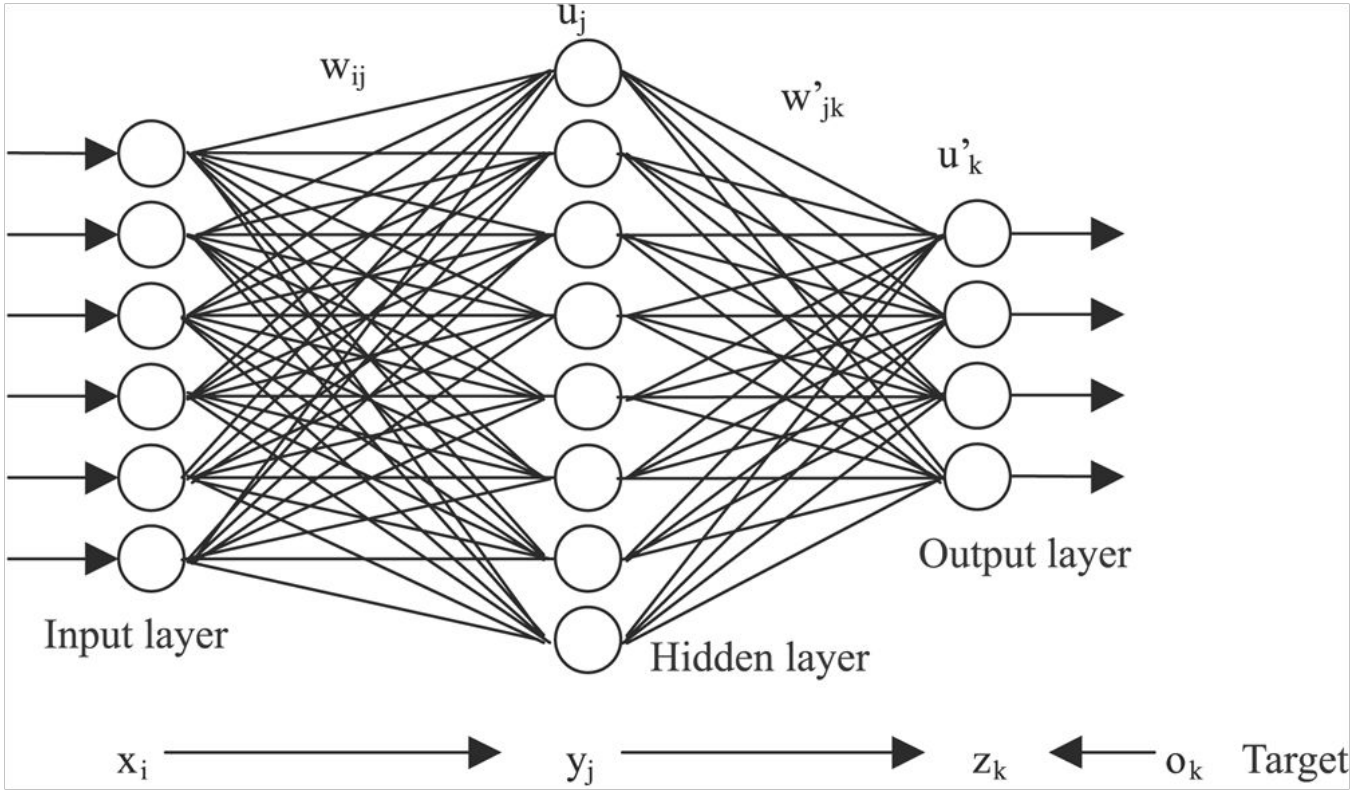
- Receives signal on synapse
- When trigger sends signal on axon

MATHEMATICAL NEURON



- Mathematical abstraction, inspired by biological neuron
- Either on or off based on sum of input

This will likely not be the last time you see this (mostly unhelpful) neural net image



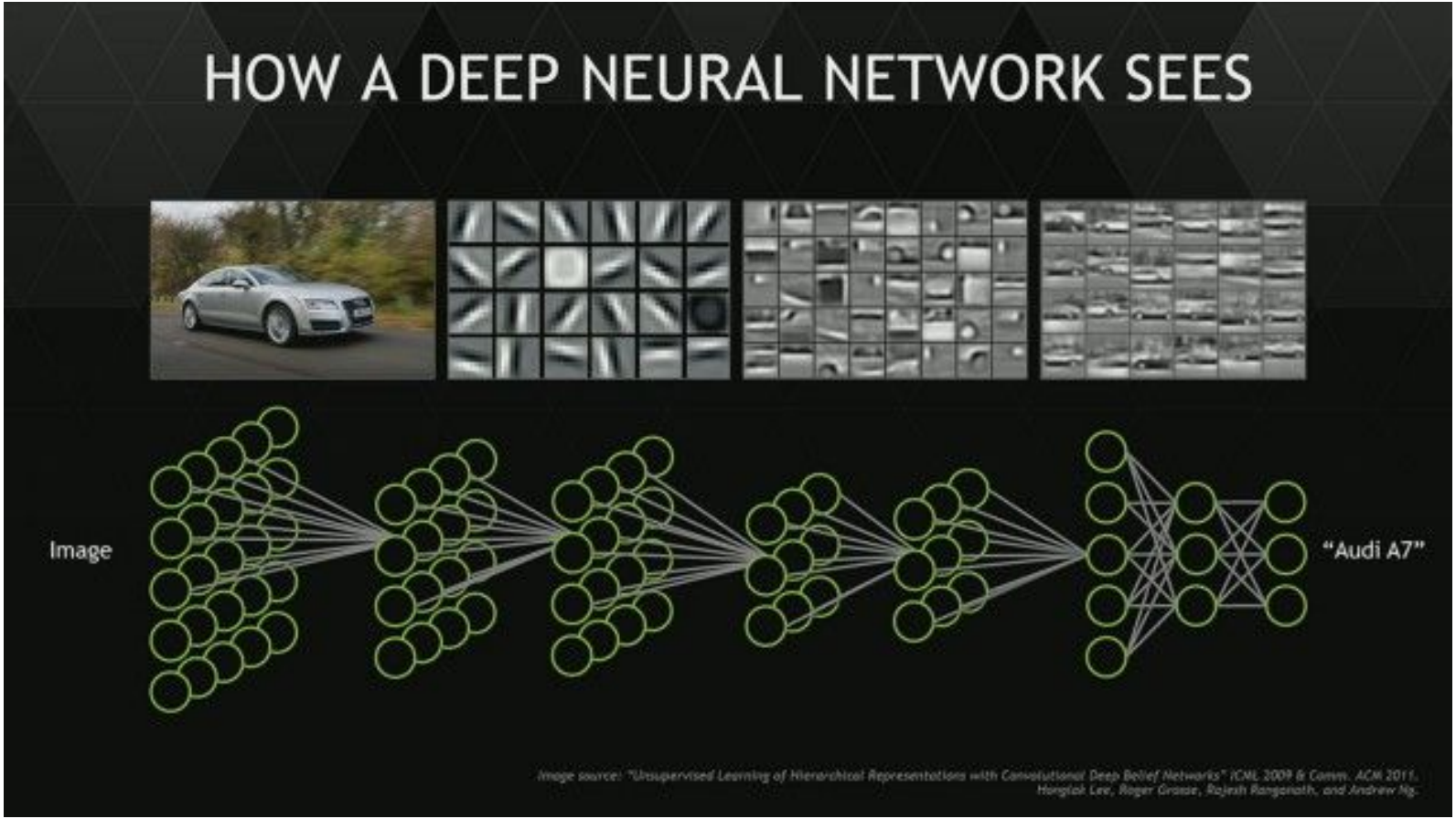
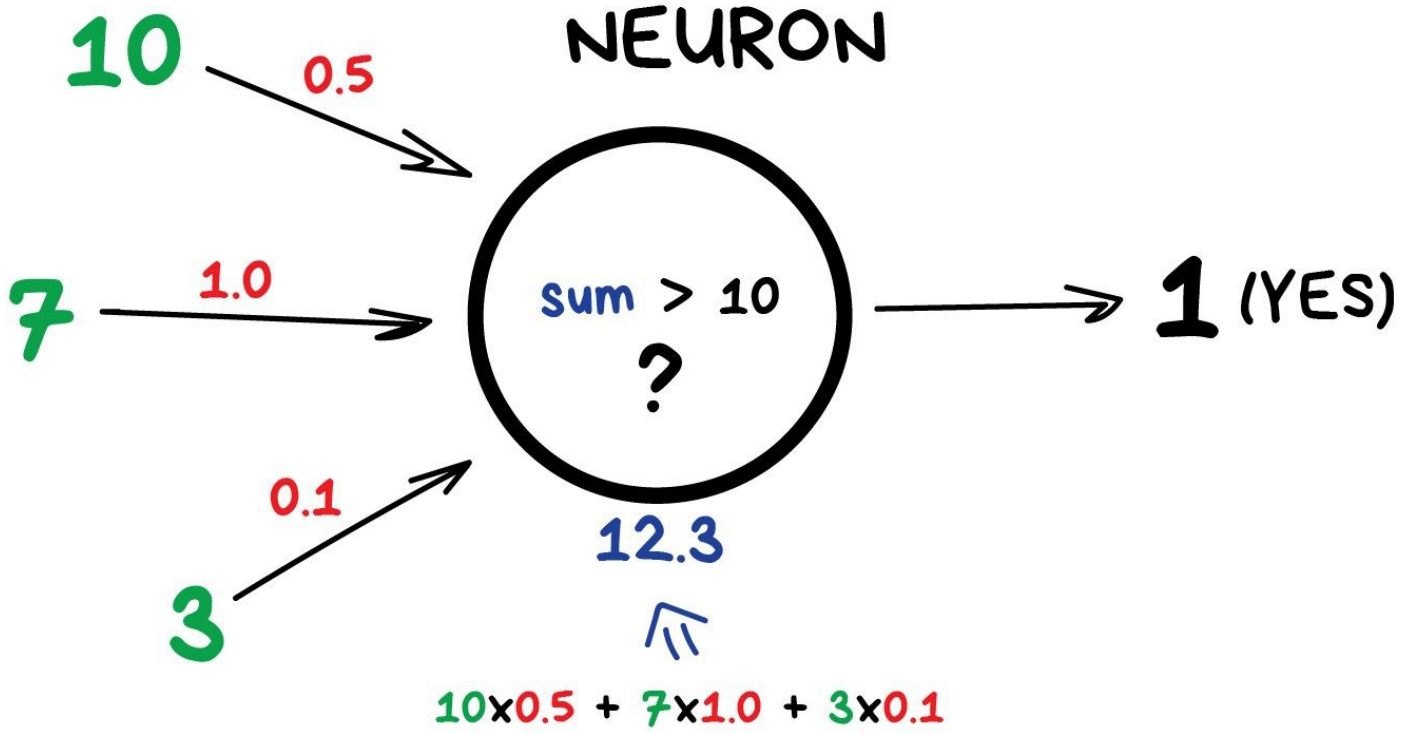


Image Source: https://towardsdatascience.com/understanding-residual-networks-9add4b664b03

These weights tell the neuron to respond more to one input and less to another. Weights are adjusted when training — that's how the network learns. Basically, that's all there is to it.



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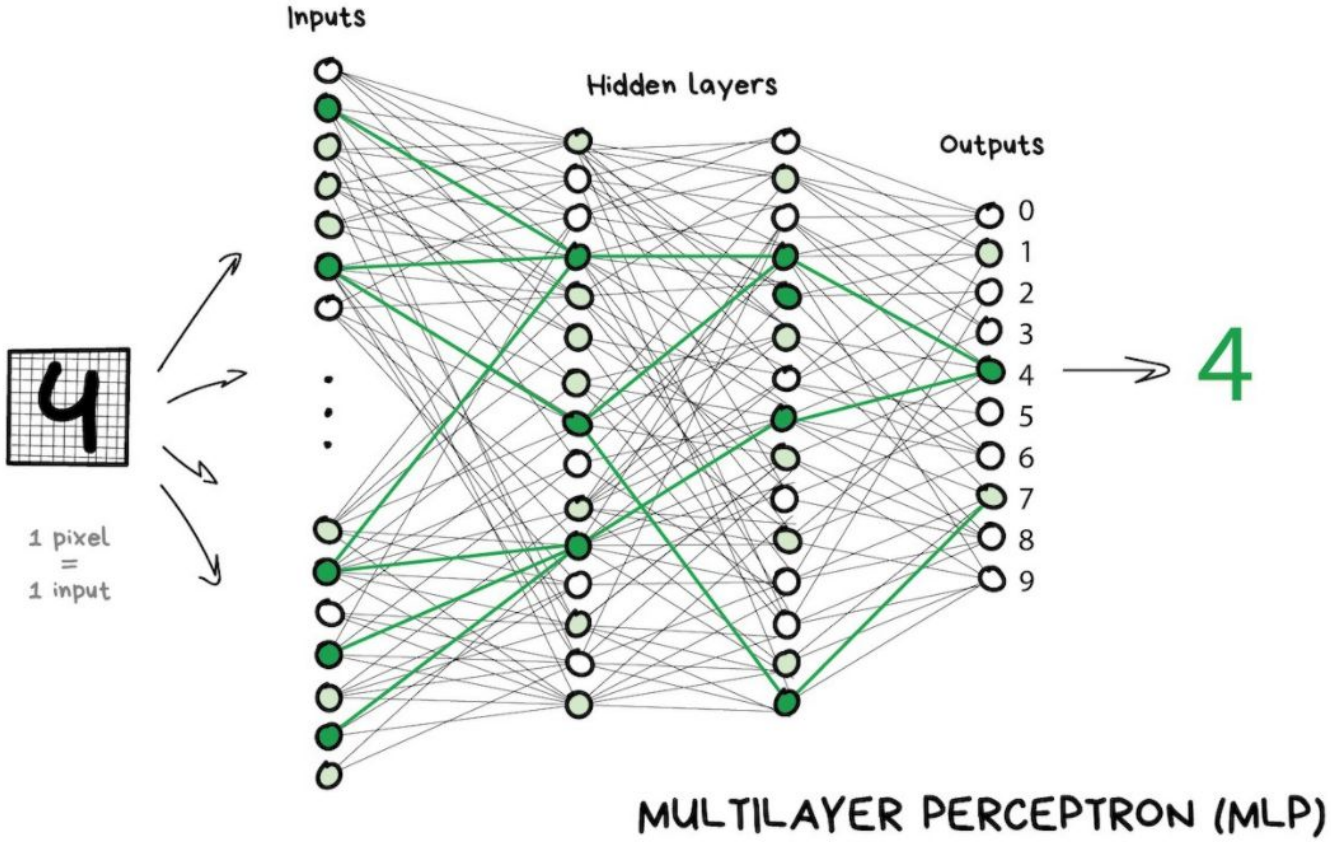

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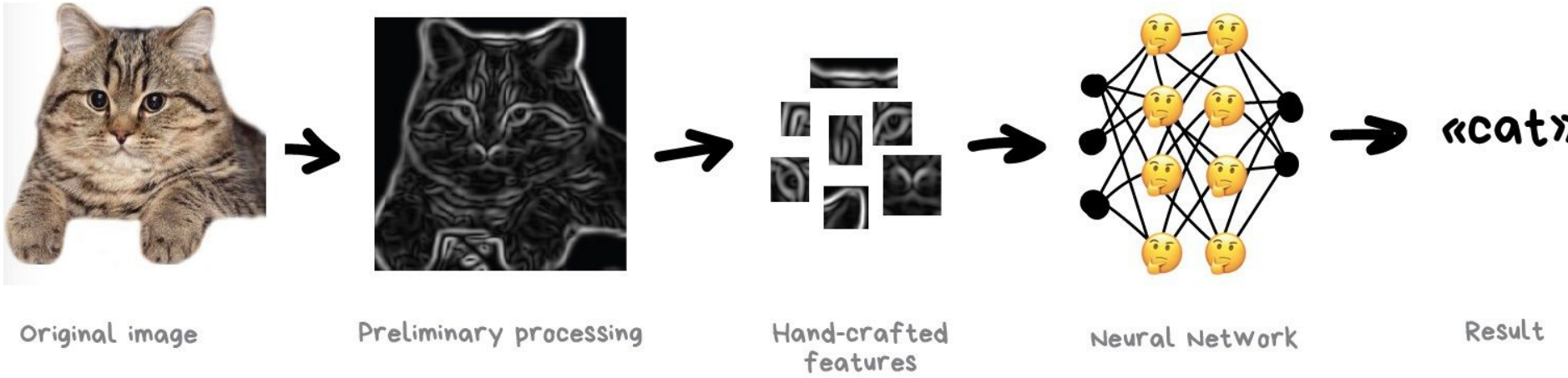
Manually labeling used to be the way...



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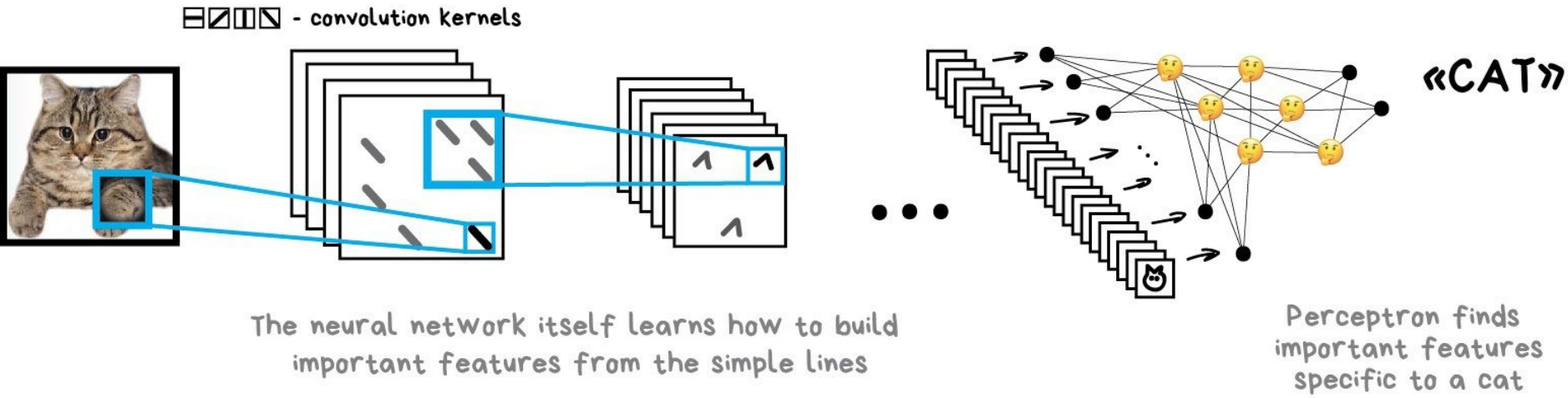
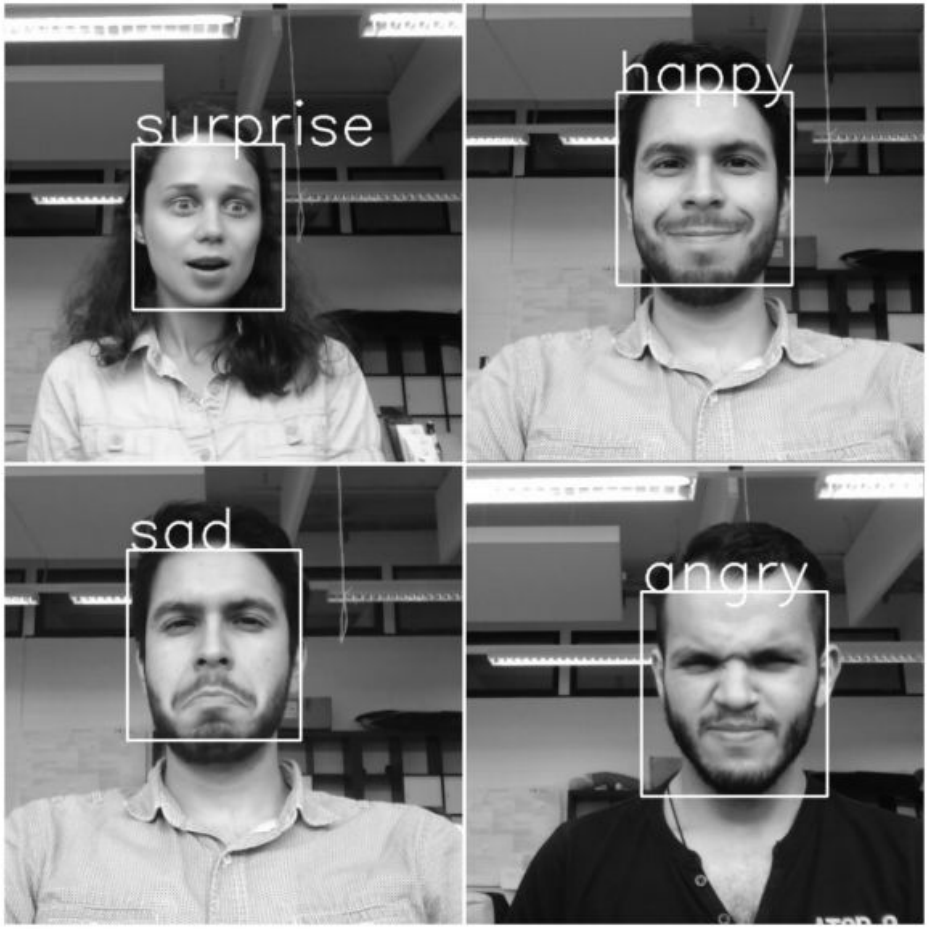
CNNs avoid manual labeling



"CNNs are all the rage right now. They are used to search for objects on photos and in videos, face recognition, style transfer, generating and enhancing images, creating effects like slow-mo and improving image quality. Nowadays CNNs are used in all the cases that involve pictures and videos."

CONVOLUTIONAL NEURAL NETWORK (CNN)

Image source: https://vas3k.com/blog/machine_learning/



https://github.com/oarriaga/face_classification